

February 2023 ERCOT Monthly Operations Report

Reliability and Operations Subcommittee Meeting

April 6, 2023

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# Report Highlights

* ERCOT set a maximum peak demand of 63,505 MW in the month of February on 02/01/2023; this is 6,307 MW less than previous February record of 69,812 MW set in 2021. This is 5,463 MW less than the February 2022 demand of 68,968 MW.
* There were 2 frequency events**.**
* There was 0 instances where Responsive Reserves was deployed.
* 1 DC Tie Curtailment Notice for the DC\_R due to a planned or unplanned outage.
* 1 OCN issued for the WESTEX IROL due to taking manual action for a topology change.
* 2 Advisories issued for postponed deadline for posting of the DAM solution due to a long running solution.
* 5 Advisories issued for a geomagnetic disturbance of K-7 and extended alerts pertaining to the disturbance.
* 1 Watch due to DRUC not completing by 1800 due to DAM timeline deviation.
* 1 Watch due to potential freezing precipitation event for the Panhandle, North, West and Central areas.
* 1 Transmission Emergency Notice issued for local congestion and unsolved contingencies due to numerous forced outages.
* There were 30 HRUC commitments
* There were 25 days of congestion on the North Edinburg to Lobo GTC, 24 days on the Bearkat GTC, 20 days on the West Texas Export GTC, 17 days on the Nelson Sharpe to Rio Hondo GTC, 15 days on the Valley Export GTC, 14 days on the Panhandle GTC, 11 days on the McCamey GTC, 4 days on the North to Houston GTC, and 1 day on the Treadwell GTC. There was no activity on the remaining GTCs during the month.

# Frequency Control

## Frequency Events

The ERCOT Interconnection experienced 2 frequency events, which resulted from units’ trip. The event average event duration was 00:05:10.

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 RRS 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)** |
| 2/8/2023 22:31:24 | 0.100 | 59.915 | 00:06:42 | 0.68 | 15% | 711 | 45,835 | 21% | 238,704 |
| 2/28/2023 18:30:15 | 0.077 | 59.910 | 00:03:38 | 0.66 | 6% | 410 | 48,973 | 29% | 238,299 |

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



## Responsive Reserve Events

There were 0 events where Responsive 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 |
|  |  |  |  |  |

## 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 30 HRUC commitments

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Resource Location** | **# of Resources** | **Operating Day** | **Total # of Hours Committed** |  **Total MWhs**  | **Reason for Commitment** |
|  FAR\_WEST, NORTH, NORTH\_CENTRAL  | 4 | 02/02/2023 | 73 |   22,317.0  |  Capacity  |
|  EAST, NORTH\_CENTRAL  | 4 | 02/03/2023 | 24 |   8,958.0  |  Capacity  |
|  NORTH, SOUTH\_CENTRAL  | 3 | 02/08/2023 | 18 |   7,374.1  | Capacity |
|  NORTH\_CENTRAL  | 1 | 02/15/2023 | 2 |   784.0  |  Capacity  |
|  NORTH\_CENTRAL  | 1 | 02/17/2023 | 2 |   1,006.0  |  Capacity  |
|  |  |  |  |  |  |
| COAST | 1 | 02/23/2023 | 3 |  504.0  | DGIBZEN5  |
| COAST, NORTH\_CENTRAL, SOUTH\_CENTRAL  | 15 | 02/24/2023 | 138 |  37,163.5  | Capacity |
| COAST  | 1 | 02/25/2023 | 21 |  14,931.0  | 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 63.4% on 02/27/2023 interval ending 01:50 and minimum IRR penetration for the month was 2.2% on 02/02/2023 interval ending 02:50.



During the hour of peak load for the month, hourly integrated wind generation was 2,816 MW and solar generation was 2.3 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 February 2023 was 1,681 MW, 2,477 MW, 3,298 MW, 6,194 MW, and 10,549 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** |
| Feb 2014 | 971 MW | 1,610 MW | 2,164 MW | 3,516 MW | 5,960 MW |
| Feb 2015 | 1,131 MW | 1,763 MW | 2,469 MW | 4,031 MW | 6,910 MW |
| Feb 2016 | 999 MW | 1,658 MW | 2,144 MW | 3,504 MW | 5,923 MW |
| Feb 2017 | 1,051 MW | 1,744 MW | 2,268 MW | 3,228 MW | 5,346 MW |
| Feb 2018 | 1,494 MW | 1,706 MW | 2,003 MW | 3,419 MW | 5,628 MW |
| Feb 2019 | 1,094 MW | 1,793 MW | 2,388 MW | 3,718 MW | 6,540 MW |
| Feb 2020 | 1,173 MW | 1,777 MW | 2,198 MW | 4,107 MW | 7,430 MW |
| Feb 2021 | 933 MW | 1,661 MW | 2,374 MW | 4,479 MW | 8,079 MW |
| Feb 2022 | 1,086 MW | 2,006 MW | 2,887 MW | 5,257 MW | 9,476 MW |
| Feb 2023 | 1,681 MW | 2,477 MW | 3,298 MW | 6,194 MW | 10,549 MW |
| All Months in 2014-2023 | 1,681 MW | 2,477 MW | 3,298 MW | 6,194 MW | 10,549 MW |

The largest net-load DOWN ramp for Feb. 2023 and historical values are shown in the table below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Month and Year** | **5 min** | **10 min** | **15 min** | **30 min** | **60 min** |
| Feb 2016 | 696 MW | 1,241 MW | 1,612 MW | 2,598 MW | 4,543 MW |
| Feb 2017 | 754 MW | 1,112 MW | 1,607 MW | 2,808 MW | 4,698 MW |
| Feb 2018 | 1,519 MW | 1,701 MW | 2,254 MW | 3,540 MW | 5,078 MW |
| Feb 2019 | 585 MW | 1,085 MW | 1,591 MW | 2,762 MW | 4,728 MW |
| Feb 2020 | 1,342 MW | 1,643 MW | 1,912 MW | 3,242 MW | 5,072 MW |
| Feb 2021 | 2,536 MW | 4,806 MW | 6,685 MW | 8,860 MW | 11,044 MW |
| Feb 2022 | 981 MW | 1,775 MW | 2,603 MW | 4,685 MW | 7,938 MW |
| Feb 2023 | 1,135 MW | 1,836 MW | 2,711 MW | 4,882 MW | 8,092 MW |
| All Months in 2016-2023 | 2,536 MW | 4,806 MW | 6,685 MW | 8,860 MW | 11,044 MW |

# 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 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** | **Contingency Name** | **Overloaded Element** | **# of Days Constraint Binding** | **Congestion Rent** | **Transmission Project** |
|  |
| DSALKLN5 | 630\_\_B | SALSW TO KLNSW 345 DBLCKT | Harker Heights South - Killeen Switch 138kV | 15 | $10,163,262.86 |   |  |
| BASE CASE | WESTEX | Basecase | WESTEX GTC | 18 | $9,792,417.12 |   |  |
| MMDSQAL5 | MDSSW\_MR1L | MAN\_DBL\_MDSSW-ODEHB\_and\_CONSW-QALSW\_345kV\_DBLCKT | Midessa South Sw 138kV | 17 | $7,353,390.67 |   |  |
| SSKYSB28 | 15081\_\_Z | SKYWEST to SPRABERRY SWITCH LIN 1 | South Midland - Consavvy Switch 138kV | 7 | $7,123,824.90 |   |  |
| BASE CASE | NE\_LOB | Basecase | NE\_LOB GTC | 22 | $6,337,304.64 | The Lower Rio Grande Valley (LRGV) System Enhancement Project (21RPG017) is expected to improve the NorthEd\_LoboGTC in the LRGV area. |  |
| DSCOTKW5 | 15060\_\_B | SCOSW TO TKWSW 345 DBLCKT | Koch Tap - Vealmoor 138kV | 11 | $5,117,199.40 |   |  |
| BASE CASE | PNHNDL | Basecase | PNHNDL GTC | 13 | $4,715,775.26 |   |  |
| DTWIDIV5 | HARGRO\_TWINBU1\_1 | TWINBU-DVIDE 345KV | Hargrove - Twin Buttes 138kV | 4 | $4,120,894.67 |   |  |
| DSTPRED5 | CKT\_3124\_1 | TWR(345) JCK-REF27 & JCK-STP18 | Hillje - South Texas Project 345kV | 3 | $3,768,402.77 |   |  |
| DBERNAR8 | 372T359\_1 | Burnet-Naruna & Bertra 138kV | Gabriel - Glasscock 138kV | 1 | $3,475,601.79 |   |  |
| BASE CASE | HHGTOM\_1 | Basecase | Omega - Horse Hollow Generation Tie 345kV | 19 | $3,462,506.95 |   |  |
| DBARMAR8 | CKT\_928\_1 | Barton-Salem1&Hicros-Marsfo 138kV | Barton - Vega 138kV | 1 | $3,283,982.09 |   |  |
| XTWI158 | V3\_W1\_1 | TWIN BUTTES TRX TWINBUTE\_3\_1 345/138 | Txresrch - Tally\_Rd 138kV | 2 | $3,265,258.21 |   |  |
| DELMSAN5 | PAWNEE\_SPRUCE\_1 | Elmcreek-Sanmigl 345kV | Pawnee Switching Station - Calaveras 345kV | 13 | $3,145,476.52 |   |  |
| MMDSQAL5 | MDSSW\_MR1H | MAN\_DBL\_MDSSW-ODEHB\_and\_CONSW-QALSW\_345kV\_DBLCKT | Midessa South Sw 345kV | 7 | $2,958,707.70 |   |  |
| BASE CASE | BEARKT | Basecase | BEARKT GTC | 21 | $2,843,113.98 |   |  |
| MHARNED5 | BURNS\_RIOHONDO\_1 | Manual dbl ckt for NEDIN-BONILLA 345kV & RIOH-PRIM138kV | Burns Sub - Rio Hondo 138kV | 14 | $2,707,850.63 | STEC RioHondo - Burns 138 kV Line Upgrade (71930) |  |
| DBIGKEN5 | HAMILT\_MAVERI1\_1 | Bighil-Kendal 345kV | Hamilton Road - Maverick 138kV | 16 | $2,621,549.28 | AEP TCC Ganso - Hamilton Road 138 kV Line Rebuild (22RPG044, MOD 55626) |  |
| DGARBRA8 | JN\_WW\_25\_A | Garrott-HOC&Bellaire-Brays 138KV | Jeanetta - Westwood 138kV | 1 | $2,595,438.78 |   |  |
| SBWDDBM5 | LPLMK\_LPLNE\_1 | BLACKWATER DRAW SWITCH to DOUBLE MOUNTAIN SWITCH LIN 1 | Mackenzie Substation - Northeast Substation 115kV | 11 | $2,566,684.69 |   |  |
| SNATBEA8 | 6144\_\_A | NATURAL DAM to BEALS CREEK SUB LIN \_A | Big Spring West - Stanton East 138kV | 19 | $2,175,995.17 | Oncor FW Big Spring West - Stanton East 138 kV Line (71989) |  |
| SMAEKEN8 | V3\_W1\_1 | MAENIUS ROAD to KENDALL CTEC LIN 1 | Txresrch - Tally\_Rd 138kV | 1 | $2,122,314.85 |   |  |
| SGLAGA28 | 33T218\_1 | GABRIEL to GLASSCOCK LCRA LIN 1 | Burnet - Wirtz 138kV | 1 | $2,089,288.76 |   |  |
| DELMELM5 | HILL\_MAR\_1\_1 | ATHNS TO TYWST 69 AND ELKTN TO FGRSW 138 DBLCKT | Hill Country - Marion 345kV | 3 | $2,065,903.79 |   |  |
| DFPPLOS5 | FAYETT\_AT2H | Fppyd1-Lostpine 345kV | Fayetteville 345kV | 2 | $1,999,542.85 |   |  |
| DBURBUC8 | 372T359\_1 | Burnet-Wirtz 138kV&Buchan 69kV | Gabriel - Glasscock 138kV | 1 | $1,819,291.24 |   |  |
| DLWSRNK5 | 587\_\_A | LWSSW TO RNKSW AND LWSSW TO KRWSW 345 DBLCKT | Argyle - Highlands Tnp 138kV | 7 | $1,666,314.83 |   |  |
| XWHI58 | NUECES\_WHITE\_2\_1 | WHITEPOINT TRX 345A 345/138 | Nueces Bay - Whitepoint 138kV | 3 | $1,600,546.55 |   |  |
| MCONLNG5 | 6095\_\_D | MAN\_DBL\_'CONSW-MGSES\_and\_CONSW-LNGSW\_345kV\_DBLCKT | Lamesa - Jim Payne Poi 138kV | 7 | $1,598,652.84 |   |  |
| DBERWE58 | 254T331\_1 | Berghe-Kendal 345kv & Welfar 138kv | Cranes Mill - Sattler 138kV | 1 | $1,580,332.54 |   |  |
| DTWIDIV5 | COKEST\_REDCRE1\_1 | TWINBU-DVIDE 345KV | San Angelo Red Creek - San Angelo Coke Street 138kV | 5 | $1,451,990.47 |   |  |
| SLOBSA25 | CATARI\_PILONC1\_1 | Fowlerton to LOBO 345 LIN1 | Catarina - Piloncillo 138kV | 8 | $1,124,637.53 |   |  |
| DGIBZEN5 | SNGXGC75\_1 | TWR(345) XGC-ZEN18 & XGC-ZEN50 | Singleton - Gibbons Creek 345kV | 2 | $1,085,156.33 |   |  |
| DSCOTKW5 | 6215\_\_A | SCOSW TO TKWSW 345 DBLCKT | Bluff Creek Switch - China Grove Switch 138kV | 9 | $1,044,602.77 |   |  |
| DCAGTA58 | H3\_K0\_1 | Cagnon-Kendall 345kV&Txresch-Tally\_Rd 138kV | Helotes - Ranchtwn 138kV | 1 | $1,024,237.95 |   |  |
| DVANEDN8 | DANEVA\_69\_1 | VANBLT-ETP 138kV&ELTORSS-EDNAS 69kV | Danevang Switching Station 138kV | 3 | $799,330.43 |   |  |
| SCMNCPS5 | 651\_\_B | COMANCHE SWITCH (Oncor) to COMANCHE PEAK SES LIN \_A | Comanche Tap - Comanche Switch (Oncor) 138kV | 13 | $791,044.21 |   |  |
| MRESMCM8 | RINCON\_WHITE\_2\_1 | Manual for I\_DUPS - RESNIK & MCCAMPBE 2 138KV | Whitepoint - Rincon 138kV | 4 | $700,587.96 |   |  |
| SBE2ASH8 | TURTLECK\_WCRYS\_1 | BEVO to ASHERTON LIN 1 | Turtle Creek Switching Station - West Crystal City Sub 69kV | 3 | $623,866.03 |   |  |
| DFL\_MAR8 | STLTB\_66\_A | Flewellen-OB&MAR 138KV | Stone Lake - Tomball 138kV | 3 | $589,856.89 |   |  |
| SCARFRI8 | ATSO\_SONR1\_1 | Carver to FRIEND RANCH LIN 1 | Atlantic Sonora - Sonora 69kV | 4 | $572,528.25 |   |  |
| DSWETKW5 | 6036\_\_A | SWESW TO TKWSW 345 DBLCKT | Tonkawa Switch - Morgan Creek Ses 345kV | 8 | $387,956.20 |   |  |
| DCALBEC8 | J0\_P0\_1 | Calavers-Kirby&Beck\_Rd 138kV | Harlanda - Southsan 138kV | 3 | $357,270.89 |   |  |
| SALAN\_28 | CELANE\_KLEBER1\_1 | BARNEY DAVIS to ALAZAN LIN 1 | Celanese Bishop - Kleberg Aep 138kV | 12 | $330,123.25 |   |  |
| DWPWFWP5 | DOWOAS18\_A | TWR(345) WAP-WLF64 & WAP-WLY72 | Oasis - Dow Chemical 345kV | 4 | $306,151.11 |   |  |
| DGILHIW8 | KOCH\_H\_LON\_HI1\_1 | Gila - Highway 9 138KV | Lon Hill - Koch Hearns Ferry 138kV | 3 | $270,674.48 |   |  |
| DMTSCOS5 | 6437\_\_F | DMTSW TO SCOSW 345 DBLCKT | Knapp - Scurry Chevron 138kV | 3 | $252,717.45 |   |  |
| DBIGKEN5 | ESCOND\_GANSO1\_1 | Bighil-Kendal 345kV | Escondido - Ganso 138kV | 10 | $250,984.20 |   |  |
| SN\_SLON5 | FALFUR\_KINGRN1\_1 | LON HILL to NELSON SHARPE LIN 1 | Falfurrias - King Ranch Gas Plant 138kV | 3 | $248,401.50 |   |  |
| DSWELNC5 | BLUF\_C\_MULBER1\_1 | SWESW TO MULBERRY AND SWESW TO LNCRK 345 DBLCKT | Bluff Creek - Abilene Mulberry Creek 345kV | 3 | $244,966.35 |   |  |
| SES2FRI8 | MIDW\_OZONA1\_1 | Esmeralda to FRIEND RANCH LIN 1 | Midway Lane - Ozona 69kV | 3 | $230,986.66 |   |  |
| SOXYIN28 | I\_DUPP\_I\_DUPS2\_1 | INGLESIDE COGEN SWITCH to OXYCHEM INGLESIDE LIN 1 | Dupont Pp1 - Ingleside - Dupont Switch - Ingleside 138kV | 4 | $217,015.14 |   |  |
| BASE CASE | VALEXP | Basecase | VALEXP GTC | 12 | $207,918.96 | The Lower Rio Grande Valley (LRGV) System Enhancement Project (21RPG017) will improve but not eliminate the need for this GTC. |  |
| DSWECBF5 | BLUF\_C\_MULBER1\_1 | SWESW TO CBFSW 345 DBLCKT | Bluff Creek - Abilene Mulberry Creek 345kV | 4 | $201,160.13 |   |  |
| SKLELOY8 | LOYOLA\_69\_1 | KLEBERG AEP to LOYOLA SUB LIN 1 | Loyola Sub 138kV | 13 | $190,269.50 |   |  |
| SLOBSA25 | LARDVN\_LASCRU1\_1 | Fowlerton to LOBO 345 LIN1 | Laredo Vft North - Las Cruces 138kV | 3 | $188,321.96 | AEP TCC Laredo VFT North to North Laredo Switch 138 kV Line Rebuild (58008) |  |
| BASE CASE | NELRIO | Basecase | NELRIO GTC | 10 | $177,126.39 | The Lower Rio Grande Valley (LRGV) System Enhancement Project (21RPG017) will cause there to be no stability constraint for NelsonSharpe\_RioHondoGTC under normal conditions. |  |
| SPOMNED5 | FREER\_LOBO1\_1 | POMELO to NORTH EDINBURG LIN 1 | Lobo - Freer 69kV | 3 | $174,051.73 |   |  |
| SLOBSA25 | ASHERT\_CATARI1\_1 | Fowlerton to LOBO 345 LIN1 | Asherton - Catarina 138kV | 3 | $167,606.60 |   |  |
| DWPWFWP5 | DA\_WC\_89\_A | TWR(345) WAP-WLF64 & WAP-WLY72 | Damon - West Columbia 138kV | 5 | $165,632.79 |   |  |
| SOXYIN28 | I\_DUPP\_I\_DUPS1\_1 | INGLESIDE COGEN SWITCH to OXYCHEM INGLESIDE LIN 1 | Dupont Pp1 - Ingleside - Dupont Switch - Ingleside 138kV | 4 | $164,837.64 |   |  |
| SSPJFS8 | JFSSC\_06\_A | JEFFERSON to COLLEGE LIN A | Jefferson - South Channel 138kV | 8 | $140,389.70 |   |  |
| SN\_SLON5 | MV\_YUT\_RAYMND1\_1 | LON HILL to NELSON SHARPE LIN 1 | Raymondville 2 - Yturria Sub 138kV | 4 | $134,593.26 |   |  |
| DSLKSOL5 | 138\_FLT\_FXT\_1 | Sand Lake - Solstice line 1 and 2 | Foxtail Tnp - Flat Top Tnp 138kV | 12 | $124,708.00 |   |  |
| DCC1DUKE | ASHERT\_CATARI1\_1 | Loss of DUKE (train) | Asherton - Catarina 138kV | 4 | $109,048.92 |   |  |
| MHARNED5 | HAINE\_\_LA\_PAL1\_1 | Manual dbl ckt for NEDIN-BONILLA 345kV & RIOH-PRIM138kV | Haine Drive - La Palma 138kV | 5 | $106,529.01 |   |  |
| SSWDMGS8 | ESKSW\_TRNT1\_1 | North Lamar POI to LORAINE SOUTH POI LIN \_A | Eskota Switch - Trent 69kV | 3 | $99,348.18 |   |  |
| SN\_SLON5 | LASPUL\_RAYMND1\_1 | LON HILL to NELSON SHARPE LIN 1 | Las Pulgas - Raymondville 2 138kV | 9 | $80,830.64 |   |  |
| DTWIDIV5 | 134T429\_1 | TWINBU-DVIDE 345KV | Schkad - San Angelo Power Station 138kV | 4 | $79,200.43 |   |  |
| BASE CASE | MCCAMY | Basecase | MCCAMY GTC | 6 | $69,721.65 |   |  |
| DTWIDIV5 | ESKSW\_TRNT1\_1 | TWINBU-DVIDE 345KV | Eskota Switch - Trent 69kV | 3 | $67,477.70 |   |  |
| DWAP\_JN5 | BI\_WAP50\_A | TWR (345) JN-WAP64 & JN-WAP72 | Bellaire - Wa Parish 345kV | 3 | $60,297.52 |   |  |
| SLOBSA25 | FREER\_LOBO1\_1 | Fowlerton to LOBO 345 LIN1 | Lobo - Freer 69kV | 3 | $53,297.88 |   |  |
| SCT2CAR8 | HAMILT\_MAVERI1\_1 | CAUTHORN to Carver LIN 1 | Hamilton Road - Maverick 138kV | 4 | $49,941.58 |   |  |
| SBTPBNT8 | MYRA\_VAL\_1 | BENNETT ROAD SWITCH to WISE COUNTY LIN \_B | Myra - Valley View Bepc 138kV | 3 | $48,638.77 | BEPC Myra - Spring 138 kV Line Rebuild (4645) |  |
| DTVWSHR5 | 495\_\_B | TVWSW TO SHRSW 345 AND TVWSW TO CDHSW 345 DBLCKT | Venus Switch - Timberview Switch 345kV | 3 | $46,306.32 |   |  |
| DKOCNUE8 | MCKENZ\_WESTSI1\_1 | Koch Upriver - Tortuga & Lon Hill - Nueces Bay 138KV | Mckenzie - Westside Aep 138kV | 3 | $43,271.55 |   |  |
| SLAQLOB8 | BRUNI\_69\_1 | LAQUINTA to LOBO LIN 1 | Bruni Sub 138kV | 5 | $25,025.51 |   |  |
| DTWIDIV5 | SAPOWE\_SAST1\_1 | TWINBU-DVIDE 345KV | San Angelo Power Station - San Angelo South Tap 138kV | 3 | $18,169.94 |   |  |
| MASHDIL8 | ASHERT\_CATARI1\_1 | ASHERTON to DILLEY SWITCH | Asherton - Catarina 138kV | 3 | $17,056.21 |   |  |
| SFORYEL8 | HEXT\_MASONS1\_1 | FORT MASON to YELLOW JACKET LIN 1 | Mason Switching Station - Hext Lcra 69kV | 3 | $14,912.58 |   |  |
| SMADSAP8 | MADDUX\_SAPOWE2\_1 | MADDUX to SAN ANGELO POWER STATION LIN 1 | Maddux - San Angelo Power Station 138kV | 6 | $13,939.75 |   |  |
| DBIGKEN5 | TREADW\_YELWJC1\_1 | Bighil-Kendal 345kV | Yellow Jacket - Treadwell 138kV | 5 | $9,519.37 |   |  |
| SDOWMOO8 | UVLD\_DOWI\_1 | MOORE SWITCHING STATION to DOWNIE SWITCHING STATION LIN 1 | Downie Switching Station - Uvalde Sub 69kV | 3 | $1,123.37 |   |  |

## Generic Transmission Constraint Congestion

There were 25 days of congestion on the North Edinburg to Lobo GTC, 24 days on the Bearkat GTC, 20 days on the West Texas Export GTC, 17 days on the Nelson Sharpe to Rio Hondo GTC, 15 days on the Valley Export GTC, 14 days on the Panhandle GTC, 11 days on the McCamey GTC, 4 days on the North to Houston GTC, and 1 day on the Treadwell 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** |
| SKYWEST to SPRABERRY SWITCH LIN 1 | Consavvy Switch - Cottonfield Sub 138kV | 2887 |  $ 44,628,271 .32  |
| Basecase | WESTEX GTC | 6018 |  $ 26,801,125.81  |
| Basecase | NE\_LOB GTC | 6003 |  $ 10,522,784.42  |
| SALSW TO KLNSW 345 DBLCKT | Harker Heights South - Killeen Switch 138kV | 3738 |  $ 10,439,870.93  |
| Basecase | BEARKT GTC | 9324 |  $ 9,447,045.36  |
| MAN\_DBL\_MDSSW-ODEHB\_and\_CONSW-QALSW\_345kV\_DBLCKT | Midessa South Sw 138kV | 2838 |  $ 8,893,789.54  |
| SKYWEST to SPRABERRY SWITCH LIN 1 | South Midland - Consavvy Switch 138kV | 1911 |  $ 7,179,589.14  |
| Fowlerton to LOBO 345 LIN1 | Catarina - Piloncillo 138kV | 3376 |  $ 6,105,355.96  |
| Basecase | Omega - Horse Hollow Generation Tie 345kV | 3685 |  $ 6,093,724.46  |
| Elmcreek-Sanmigl 345kV | Pawnee Switching Station - Calaveras 345kV | 2976 |  $ 5,944,769.31  |
| NATURAL DAM to BEALS CREEK SUB LIN \_A | Big Spring West - Stanton East 138kV | 5180 |  $ 5,611,922.47  |
| TWR (345) OB-WAP98 & OB-WAP99 | Jeanetta - Westwood 138kV | 490 |  $ 5,448,197.58  |
| SCOSW TO TKWSW 345 DBLCKT | Koch Tap - Vealmoor 138kV | 2258 |  $ 5,117,199.40  |
| Manual dbl ckt for NEDIN-BONILLA 345kV & RIOH-PRIM138kV | Burns Sub - Rio Hondo 138kV | 2909 |  $ 4,826,107.97  |
| Basecase | PNHNDL GTC | 2546 |  $ 4,715,775.26  |
| TWINBU-DVIDE 345KV | Hargrove - Twin Buttes 138kV | 525 |  $ 4,239,510.15  |
| Manual for I\_DUPS - RESNIK & MCCAMPBE 2 138KV | Whitepoint - Rincon 138kV | 1199 |  $ 4,171,805.25  |
| McNeil-Decker&Dessau 138kV | Mcneil Aen - Dessau 138kV | 506 |  $ 4,100,159.11  |
| TWINBU-DVIDE 345KV | San Angelo Red Creek - San Angelo Coke Street 138kV | 1913 |  $ 3,887,415.45  |
| TWR(345) JCK-REF27 & JCK-STP18 | Hillje - South Texas Project 345kV | 588 |  $ 3,768,402.77  |

# System Events

## ERCOT Peak Load

The unofficial ERCOT peak load[[2]](#footnote-2) for the month was 63,505 MW and occurred on 02/01/2023, 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.

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

## DC Tie Curtailment

There was one DC tie curtailments.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date** | **DC Tie** | **Curtailing Period** | **# of Tags Curtailed** | **Initiating Event** | **Curtailment Reason[[3]](#footnote-3)[[4]](#footnote-4)** |
| 2/13/2023 – 2/14/2023 | DC\_R | HE 23 – HE 24 HE 01 – HE 24 | 8 | Forced Outage | Planned or Unplanned Outage |

## TRE/DOE Reportable Events

* Cross Texas Transmission submitted an EOP-004-4 for 02/01/2023. Reportable Event Type: Complete loss of monitoring or control capability at BES control center.
* AEN submitted a DOE-OE-417 for 02/01/2023. Reportable Event Type: Loss of electric service.
* AEN submitted a DOE-OE-417 for 02/01/2023. Reportable Event Type: Loss of 50,000 customers.
* AEN submitted a DOE-OE-417 for 02/01/2023. Reportable Event Type: Loss of 50,000 customers.AEP submitted a DOE-OE-417 for 02/11/2023. Reportable Event Type: Unexpected Transmission loss within its area.
* BPUB submitted a DOE-OE-417 for 02/21/2023. Reportable Event Type: Cyber event

## New/Updated Constraint Management Plans

None.

## New/Modified/Removed RAS

None.

## New Procedures/Forms/Operating Bulletins

None.

# Emergency Conditions

## OCNs

|  |  |
| --- | --- |
| **Date and Time** | **Message** |
| Feb 23, 2023 04:24 CPT | ERCOT issued an OCN for West Texas IROL due to taking manual action for a topology change.  |

## Advisories

|  |  |
| --- | --- |
| **Date and Time** | **Message** |
| Feb 15, 2023 13:30 CPT | ERCOT has postponed the deadline for the posting of the DAM solution for Operating Day 02/16/2023 due to long running solution. |
| Feb 19, 2023 13:30 CPT | ERCOT has postponed the deadline for the posting of the DAM solution for Operating Day 02/20/2023 due to long running solution. |
| Feb 27, 2023 02:30 CPT | Advisory issued for a geomagnetic disturbance of K-7 Alert until February 27, 2023 at 03:00. |
| Feb 27, 2023 2:38 CPT | The Space Weather Prediction Center has extended the Alert of K-7 until February 27, 2023 at 06:00. |
| Feb 27, 2023 5:46 CPT | The Space Weather Prediction Center has extended the Alert of K-7 until February 27, 2023 at 06:45. |
| Feb 27, 2023 5:50 CPT | The Space Weather Prediction Center has extended the Alert of K-7 until February 27, 2023 at 07:00. |
| Feb 27, 2023 10:00 CPT | Advisory issued for a geomagnetic disturbance K- 7 Alert until February 27, 2023 at 12:00. |

## Watches

|  |  |
| --- | --- |
| **Date and Time** | **Message** |
| Feb 2, 2023 10:00 CPT | Extending the Watch issued due to a potential freezing precipitation event for the Panhandle, North, West and Central areas of the ERCOT Region beginning on Monday, January 30, 2023 through Thursday, February 2, 2023 until Friday, February 3, 2023 at 12:00. |
| Feb 15, 2023 18:00 CPT | ERCOT issued a Watch due to DRUC not completing by 18:00 due to DAM timeline deviation. |

## Emergency Notices

|  |  |
| --- | --- |
| **Date and Time** | **Message** |
| Feb 2, 2023 12:22 CPT | ERCOT issued a Transmission Emergency for local congestion (contingency DBERNAR8) and unsolved contingencies in the Leander and Andice area due to numerous forced outages. |

# 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) | 7 |
| BRAZOS ELECTRIC POWER CO OP INC (TDSP) | 1 |
| BROWNSVILLE PUBLIC UTILITIES BOARD (TDSP) | 0 |
| BRYAN TEXAS UTILITIES (TDSP) | 0 |
| CENTERPOINT ENERGY HOUSTON ELECTRIC LLC (TDSP) | 8 |
| CITY OF AUSTIN DBA AUSTIN ENERGY (TDSP) | 0 |
| CITY OF COLLEGE STATION (TDSP) | 0 |
| CITY OF GARLAND (TDSP) | 0 |
| CPS ENERGY (TDSP) | 1 |
| DENTON MUNICIPAL ELECTRIC (TDSP) | 0 |
| ELECTRIC TRANSMISSION TEXAS LLC (TDSP) | 0 |
| ERCOT | 3 |
| LCRA TRANSMISSION SERVICES CORPORATION (TDSP) | 10 |
| LONE STAR TRANSMISSION LLC (TSP) | 0 |
| ONCOR ELECTRIC DELIVERY COMPANY LLC (TDSP) | 12 |
| 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) | 1 |

# 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 | 2 | BASE CASE | NE\_LOB | n/a | n/a | 24 |
| 2023 | 2 | BASE CASE | BEARKT | n/a | n/a | 23 |
| 2023 | 2 | SNATBEA8 | 6144\_\_A | BSPRW | STASW | 22 |
| 2023 | 2 | DBIGKEN5 | HAMILT\_MAVERI1\_1 | MAVERICK | HAMILTON | 20 |
| 2023 | 2 | DBIGKEN5 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 20 |
| 2023 | 2 | MMDSQAL5 | MDSSW\_MR1L | MDSSW | MDSSW | 19 |
| 2023 | 2 | BASE CASE | WESTEX | n/a | n/a | 19 |
| 2023 | 2 | BASE CASE | HHGTOM\_1 | HHGT | OMEGA | 19 |
| 2023 | 2 | MHARNED5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 17 |
| 2023 | 2 | DSALKLN5 | 630\_\_B | KLNSW | HHSTH | 17 |
| 2023 | 2 | BASE CASE | NELRIO | n/a | n/a | 16 |
| 2023 | 2 | SCMNCPS5 | 651\_\_B | CMNSW | CMNTP | 16 |
| 2023 | 2 | DSLKSOL5 | 138\_FLT\_FXT\_1 | TNFXTAIL | FLAT\_TOP | 15 |
| 2023 | 2 | BASE CASE | VALEXP | n/a | n/a | 15 |
| 2023 | 2 | DELMSAN5 | PAWNEE\_SPRUCE\_1 | PAWNEE | CALAVERS | 15 |
| 2023 | 2 | SKLELOY8 | LOYOLA\_69\_1 | LOYOLA | LOYOLA | 14 |
| 2023 | 2 | SALAN\_28 | CELANE\_KLEBER1\_1 | CELANEBI | KLEBERG | 14 |
| 2023 | 2 | SBWDDBM5 | LPLMK\_LPLNE\_1 | LPLMK | LPLNE | 13 |
| 2023 | 2 | BASE CASE | PNHNDL | n/a | n/a | 13 |
| 2023 | 2 | SN\_SLON5 | LASPUL\_RAYMND1\_1 | LASPULGA | RAYMND2 | 12 |
| 2023 | 2 | DSCOTKW5 | 15060\_\_B | VEALMOOR | KOCHTAP | 12 |
| 2023 | 2 | SLOBSA25 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 11 |
| 2023 | 2 | SSKYSB28 | 15081\_\_Z | SMIDLAND | CONSW | 11 |
| 2023 | 2 | SLOBSA25 | CATARI\_PILONC1\_1 | PILONCIL | CATARINA | 11 |
| 2023 | 2 | DSCOTKW5 | 6215\_\_A | BCKSW | CGRSW | 11 |
| 2023 | 2 | MMDSQAL5 | MDSSW\_MR1H | MDSSW | MDSSW | 11 |
| 2023 | 2 | DBIGKEN5 | ESCOND\_GANSO1\_1 | GANSO | ESCONDID | 11 |
| 2023 | 2 | BASE CASE | MCCAMY | n/a | n/a | 11 |
| 2023 | 2 | DLWSRNK5 | 587\_\_A | ARGYL | LWSVH | 10 |
| 2023 | 2 | MCONLNG5 | 6095\_\_D | LMESA | JPPOI | 10 |
| 2023 | 2 | SMADSAP8 | MADDUX\_SAPOWE2\_1 | SAPOWER | MADDUX | 9 |
| 2023 | 2 | SMADSAP8 | MADDUX\_SAPOWE2\_1 | MADDUX | SAPOWER | 9 |
| 2023 | 2 | SSPJFS8 | JFSSC\_06\_A | SC | JFS | 9 |
| 2023 | 2 | SSPJFS8 | JFSSC\_06\_A | JFS | SC | 9 |
| 2023 | 2 | DSWETKW5 | 6036\_\_A | TKWSW | MGSES | 9 |
| 2023 | 2 | DGRSPKR5 | 6377\_\_A | BRTSW | ORANS | 8 |
| 2023 | 2 | DBIGKEN5 | TREADW\_YELWJC1\_1 | TREADWEL | YELWJCKT | 8 |
| 2023 | 2 | SCARFRI8 | ATSO\_SONR1\_1 | SONR | ATSO | 8 |
| 2023 | 2 | SCARFRI8 | ATSO\_SONR1\_1 | ATSO | SONR | 8 |
| 2023 | 2 | DMTSCOS5 | 6437\_\_F | SCRCV | KNAPP | 7 |
| 2023 | 2 | DTWIDIV5 | COKEST\_REDCRE1\_1 | REDCREEK | COKESTRE | 7 |
| 2023 | 2 | MRESMCM8 | RINCON\_WHITE\_2\_1 | RINCON | WHITE\_PT | 7 |
| 2023 | 2 | MRESMCM8 | RINCON\_WHITE\_2\_1 | WHITE\_PT | RINCON | 7 |
| 2023 | 2 | SLOBSA25 | LARDVN\_LASCRU1\_1 | LARDVNTH | LASCRUCE | 7 |
| 2023 | 2 | DWISALV8 | MYRA\_VAL\_1 | MYRA | VALYVIEW | 7 |
| 2023 | 2 | MHARNED5 | HAINE\_\_LA\_PAL1\_1 | LA\_PALMA | HAINE\_DR | 7 |
| 2023 | 2 | SBTPBNT8 | MYRA\_VAL\_1 | MYRA | VALYVIEW | 6 |
| 2023 | 2 | DTWIDIV5 | 134T429\_1 | SAPOWER | SCHKAD | 6 |
| 2023 | 2 | DSWECBF5 | BLUF\_C\_MULBER1\_1 | MULBERRY | BLUF\_CRK | 6 |
| 2023 | 2 | SFORYEL8 | HEXT\_MASONS1\_1 | MASONSW | HEXT | 6 |
| 2023 | 2 | SFORYEL8 | HEXT\_MASONS1\_1 | HEXT | MASONSW | 6 |
| 2023 | 2 | DWPWFWP5 | DA\_WC\_89\_A | WC | DA | 6 |
| 2023 | 2 | SBE2ASH8 | TURTLECK\_WCRYS\_1 | TURTLCRK | WCRYSTS | 6 |
| 2023 | 2 | SBE2ASH8 | TURTLECK\_WCRYS\_1 | WCRYSTS | TURTLCRK | 6 |
| 2023 | 2 | SCT2CAR8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 6 |
| 2023 | 2 | DTWIDIV5 | SAPOWE\_SAST1\_1 | SAST | SAPOWER | 6 |
| 2023 | 2 | SN\_SLON5 | FALFUR\_KINGRN1\_1 | FALFUR | KINGRNCH | 5 |
| 2023 | 2 | DSLKSOL5 | 138\_BRL\_FLT\_1 | FLAT\_TOP | TNBRDRAW | 5 |
| 2023 | 2 | SLAQLOB8 | BRUNI\_69\_1 | BRUNI | BRUNI | 5 |
| 2023 | 2 | DVANEDN8 | DANEVA\_69\_1 | DANEVA | DANEVA | 5 |
| 2023 | 2 | SGRICOL5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 5 |
| 2023 | 2 | DMOLLO58 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 5 |
| 2023 | 2 | SLOBSA25 | FREER\_LOBO1\_1 | LOBO | FREER | 5 |
| 2023 | 2 | SPOMNED5 | FREER\_LOBO1\_1 | LOBO | FREER | 4 |
| 2023 | 2 | SOXYIN28 | I\_DUPP\_I\_DUPS2\_1 | I\_DUPP1 | I\_DUPSW | 4 |
| 2023 | 2 | DTWIDIV5 | REDCREEK\_T2L | REDCREEK | REDCREEK | 4 |
| 2023 | 2 | DGILHIW8 | KOCH\_H\_LON\_HI1\_1 | LON\_HILL | KOCH\_HF | 4 |
| 2023 | 2 | DSCOTKW5 | 15060\_\_A | KOCHTAP | BUZSW | 4 |
| 2023 | 2 | DWHICOT5 | FARMLAND\_LONGD\_1 | FARMLAND | W\_LD\_345 | 4 |
| 2023 | 2 | DGILHIW8 | KOCH\_H\_LON\_HI1\_1 | KOCH\_HF | LON\_HILL | 4 |
| 2023 | 2 | SW\_SBRN5 | 15010\_\_B | BLISS | ESTILES | 4 |
| 2023 | 2 | DTWIDIV5 | BIGLAK\_RUSSEK1\_1 | BIGLAKE | RUSSEKST | 4 |
| 2023 | 2 | DWAP\_JN5 | BI\_WAP50\_A | WAP | BI | 4 |
| 2023 | 2 | SOXYIN28 | I\_DUPP\_I\_DUPS1\_1 | I\_DUPP1 | I\_DUPSW | 4 |
| 2023 | 2 | DFL\_MAR8 | STLTB\_66\_A | TB | STL | 4 |
| 2023 | 2 | DCC1DUKE | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 4 |
| 2023 | 2 | DWPWFWP5 | DOWOAS18\_A | DOW | OAS | 4 |
| 2023 | 2 | SN\_SLON5 | MV\_YUT\_RAYMND1\_1 | RAYMND2 | MV\_YUTT | 4 |
| 2023 | 2 | SCENLOB5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 4 |
| 2023 | 2 | DTVWSHR5 | 495\_\_B | TVWSW | VENSW | 4 |
| 2023 | 2 | SLOBSA25 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 4 |
| 2023 | 2 | DTWIDIV5 | HARGRO\_TWINBU1\_1 | TWINBU | HARGROVE | 4 |
| 2023 | 2 | DMGSBTR5 | 6036\_\_A | TKWSW | MGSES | 4 |
| 2023 | 2 | SBONNED5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 3 |
| 2023 | 2 | DODEMOS5 | ODEHV\_MR2H | ODEHV | ODEHV | 3 |
| 2023 | 2 | XWHI58 | NUECES\_WHITE\_2\_1 | NUECES\_B | WHITE\_PT | 3 |
| 2023 | 2 | SDOWMOO8 | UVLD\_DOWI\_1 | DOWNIES | UVLDES | 3 |
| 2023 | 2 | SBIGTWI5 | ESCOND\_GANSO1\_1 | GANSO | ESCONDID | 3 |
| 2023 | 2 | DJFSFT\_8 | JFSSC\_06\_A | JFS | SC | 3 |
| 2023 | 2 | SPLUMUL8 | MAGRUD\_VICTOR2\_1 | VICTORIA | MAGRUDER | 3 |
| 2023 | 2 | SN\_SLON5 | ARMSTR\_MV\_YUT1\_1 | MV\_YUTT | ARMSTRON | 3 |
| 2023 | 2 | DCALBEC8 | J0\_P0\_1 | P0 | J0 | 3 |
| 2023 | 2 | DJFSFT\_8 | JFSSC\_06\_A | SC | JFS | 3 |
| 2023 | 2 | SES2FRI8 | MIDW\_OZONA1\_1 | MIDW | OZONA | 3 |
| 2023 | 2 | SOBWAP5 | OB\_WAP98\_A | WAP | OB | 3 |
| 2023 | 2 | MCONQAL5 | 6095\_\_D | LMESA | JPPOI | 3 |
| 2023 | 2 | DSTPRED5 | CKT\_3124\_1 | STP | HLJ | 3 |
| 2023 | 2 | SSWDMGS8 | ESKSW\_TRNT1\_1 | ESKSW | TRNT | 3 |
| 2023 | 2 | MCONLNG5 | HARGRO\_TWINBU1\_1 | TWINBU | HARGROVE | 3 |
| 2023 | 2 | DELMELM5 | HILL\_MAR\_1\_1 | MARION | HILLCTRY | 3 |
| 2023 | 2 | SKLEKLE8 | LOYOLA\_69\_1 | LOYOLA | LOYOLA | 3 |
| 2023 | 2 | SW\_GODE5 | 15060\_\_B | VEALMOOR | KOCHTAP | 3 |
| 2023 | 2 | SLOBSA25 | BRUNI\_69\_1 | BRUNI | BRUNI | 3 |
| 2023 | 2 | DTWIDIV5 | ESKSW\_TRNT1\_1 | ESKSW | TRNT | 3 |
| 2023 | 2 | SWRDYN8 | LAN\_CT\_PAVLOV1\_1 | LAN\_CTY | PAVLOV | 3 |
| 2023 | 2 | DSALHUT5 | 270\_\_A | KNBSW | TMPSW | 3 |
| 2023 | 2 | MCONMDS5 | 6051\_\_A | QALSW | ODEHV | 3 |
| 2023 | 2 | SQALODE5 | 6059\_\_B | CONSW | MDSSW | 3 |
| 2023 | 2 | MASHDIL8 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 3 |
| 2023 | 2 | DSWELNC5 | BLUF\_C\_MULBER1\_1 | BLUF\_CRK | MULBERRY | 3 |
| 2023 | 2 | DKOCNUE8 | MCKENZ\_WESTSI1\_1 | MCKENZIE | WESTSIDE | 3 |
| 2023 | 2 | SES2FRI8 | MIDW\_OZONA1\_1 | OZONA | MIDW | 3 |
| 2023 | 2 | BASE CASE | N\_TO\_H | n/a | n/a | 3 |
| 2023 | 2 | DCOLFA59 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 3 |
| 2023 | 2 | DGIBZEN5 | SNGXGC75\_1 | GIBCRK | SNG | 3 |
| 2023 | 2 | XNED358 | FREER\_LOBO1\_1 | LOBO | FREER | 3 |
| 2023 | 2 | SFORYEL8 | HEXT\_YELWJC1\_1 | YELWJCKT | HEXT | 3 |
| 2023 | 2 | DKOCNUE8 | MCKENZ\_WESTSI1\_1 | WESTSIDE | MCKENZIE | 3 |
| 2023 | 2 | XTWI158 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 3 |
| 2023 | 2 | MCONLNG5 | 15010\_\_B | BLISS | ESTILES | 2 |
| 2023 | 2 | SBNBPK25 | 6005\_\_A | PKRSW | BNBSW | 2 |
| 2023 | 2 | MMGSCON5 | 6095\_\_D | LMESA | JPPOI | 2 |
| 2023 | 2 | XPAD89 | BENJTA\_MUNDAY1\_1 | MUNDAYST | BENJTAP | 2 |
| 2023 | 2 | DGARHIC8 | CKT\_920\_1 | AUSTRO | DUNLAP | 2 |
| 2023 | 2 | DFL\_MAR8 | DA\_WC\_89\_A | WC | DA | 2 |
| 2023 | 2 | DFPPLOS5 | FAYETT\_AT2H | FAYETT | FAYETT | 2 |
| 2023 | 2 | DRAFTX\_8 | KARNES\_KENEDS1\_1 | KENEDSW | KARNESCI | 2 |
| 2023 | 2 | DMCEBUT8 | MKLT\_TRNT1\_1 | TRNT | MKLT | 2 |
| 2023 | 2 | XBLE58 | SAR\_FRAN\_1 | FRANKC | SARGNTS | 2 |
| 2023 | 2 | SSCLWF28 | 6840\_\_B | NVKSW | ANARN | 2 |
| 2023 | 2 | SASPPAI8 | ASPM\_69T2 | ASPM | ASPM | 2 |
| 2023 | 2 | XPAD89 | BENJTA\_MUNDAY1\_1 | BENJTAP | MUNDAYST | 2 |
| 2023 | 2 | MEABBOG8 | CO\_PL\_84\_A | PL | CO | 2 |
| 2023 | 2 | SMV\_RI28 | SCARBI\_STILLM1\_1 | SCARBIDE | STILLMAN | 2 |
| 2023 | 2 | DLYTZOR5 | 106T200\_1 | REDWOO | SANMAR | 2 |
| 2023 | 2 | DLWSRNK5 | 584\_\_A | KRMSW | ARGYL | 2 |
| 2023 | 2 | SOWLBIG8 | BISON\_STRS1\_1 | BISON | STRS | 2 |
| 2023 | 2 | DTWIDIV5 | CRMW5T\_STER1\_1 | STER | CRMW5TP | 2 |
| 2023 | 2 | DLEOTRU8 | KARNES\_KENEDS1\_1 | KENEDSW | KARNESCI | 2 |
| 2023 | 2 | DVANELT8 | NUR\_FORT\_1 | NURSRYS | FORTRSW | 2 |
| 2023 | 2 | DWHILON5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 2 |
| 2023 | 2 | DHENCOM8 | 97T205\_1 | ZORN | MCCALA | 2 |
| 2023 | 2 | SPADTAR8 | BENJTA\_MUNDAY1\_1 | BENJTAP | MUNDAYST | 2 |
| 2023 | 2 | DCAGCI58 | BERGHE\_AT1H | BERGHE | BERGHE | 2 |
| 2023 | 2 | DLYTTUR8 | CKT\_943\_1 | LYTTON\_S | PILOT | 2 |
| 2023 | 2 | DTWIDIV5 | CRMW5T\_STER1\_1 | CRMW5TP | STER | 2 |
| 2023 | 2 | DWPWFCK5 | DOWOAS18\_A | DOW | OAS | 2 |
| 2023 | 2 | SSUTF18 | KARNES\_KENEDS1\_1 | KENEDSW | KARNESCI | 2 |
| 2023 | 2 | DWLDSCO5 | 15060\_\_B | VEALMOOR | KOCHTAP | 2 |
| 2023 | 2 | MCONQAL5 | 6471\_\_A | MGSES | MCDLD | 2 |
| 2023 | 2 | SALAN\_28 | CELANE\_N\_SHAR1\_1 | N\_SHARPE | CELANEBI | 2 |
| 2023 | 2 | SF2KEN8 | KARNES\_KENEDS1\_1 | KENEDSW | KARNESCI | 2 |
| 2023 | 2 | DLONEQU8 | KOCH\_H\_LON\_HI1\_1 | LON\_HILL | KOCH\_HF | 2 |
| 2023 | 2 | SMV\_PAR8 | RIOHND\_ERIOHND\_1 | MV\_RIOHO | RIOHONDO | 2 |
| 2023 | 2 | MCOMPR28 | RYSSW\_FMR2 | RYSSW | RYSSW | 2 |
| 2023 | 2 | DKENCA58 | V3\_W1\_1 | V3 | W1 | 2 |
| 2023 | 2 | XTWI158 | V3\_W1\_1 | V3 | W1 | 2 |
| 2023 | 2 | DSCOTKW5 | 6095\_\_D | LMESA | JPPOI | 2 |
| 2023 | 2 | DBYRBOW5 | 6856\_\_B | BMRTN | SMOUR | 2 |
| 2023 | 2 | DCAGCO58 | BERGHE\_AT1H | BERGHE | BERGHE | 2 |
| 2023 | 2 | DJN\_RO28 | BR\_HOC09\_A | BR | HOC | 2 |
| 2023 | 2 | DREFSTP5 | CKT\_3124\_1 | STP | HLJ | 2 |
| 2023 | 2 | SBGLTWI8 | CONCHO\_SANW0\_1 | CONCHO | SANW | 2 |
| 2023 | 2 | SN\_SLON5 | HAINE\_\_LA\_PAL1\_1 | LA\_PALMA | HAINE\_DR | 2 |
| 2023 | 2 | DGARBRA8 | JN\_WW\_25\_A | JN | WW | 2 |
| 2023 | 2 | SPADTAR8 | BENJTA\_MUNDAY1\_1 | MUNDAYST | BENJTAP | 2 |
| 2023 | 2 | MBURSAC9 | CEDRHI\_SILT1\_1 | CEDRHILL | SILT | 2 |
| 2023 | 2 | DAIRB\_D8 | CELANE\_KLEBER1\_1 | CELANEBI | KLEBERG | 2 |
| 2023 | 2 | SBIGTWI5 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 2 |
| 2023 | 2 | SDIMBEV8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 2 |
| 2023 | 2 | SMENH338 | V3\_W1\_1 | V3 | W1 | 2 |
| 2023 | 2 | SBAKNOR5 | 6095\_\_D | LMESA | JPPOI | 2 |
| 2023 | 2 | SSNDAUS5 | AUSTRO\_AT1H | AUSTRO | AUSTRO | 2 |
| 2023 | 2 | XAUS58 | AUSTRO\_AT1H | AUSTRO | AUSTRO | 2 |
| 2023 | 2 | XNED258 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 2 |
| 2023 | 2 | DSTPHLJ5 | CKT\_3124\_1 | STP | HLJ | 2 |
| 2023 | 2 | DWPWFWP5 | DOWOAS27\_A | DOW | OAS | 2 |
| 2023 | 2 | SHILMAR5 | E5\_P4\_2\_1 | ELMCREEK | SKYLINE | 2 |
| 2023 | 2 | SI\_DI\_38 | I\_DUPP\_I\_DUPS1\_1 | I\_DUPP1 | I\_DUPSW | 2 |
| 2023 | 2 | DLONWEI8 | KOCH\_H\_LON\_HI1\_1 | LON\_HILL | KOCH\_HF | 2 |
| 2023 | 2 | DWESNUE8 | KOCH\_H\_LON\_HI1\_1 | LON\_HILL | KOCH\_HF | 2 |
| 2023 | 2 | SFORYEL8 | MASNPH\_MASN1\_1 | MASN | MASNPHT | 2 |
| 2023 | 2 | BASE CASE | N\_SHARPE\_PS3 | N\_SHARPE | N\_SHARPE | 2 |
| 2023 | 2 | DTWIDIV5 | PALOUS\_WOLFCA1\_1 | PALOUSE | WOLFCAMP | 2 |
| 2023 | 2 | SV3CAG8 | R4\_Z1\_1 | CAGNON | Z1 | 2 |
| 2023 | 2 | DCAGBRA5 | R5\_T5\_1 | HILLCTRY | CAGNON | 2 |
| 2023 | 2 | DCAGCI58 | 85T329\_1 | BERGHE | DEVIHI | 1 |
| 2023 | 2 | DCAGCO58 | 85T329\_1 | BERGHE | DEVIHI | 1 |
| 2023 | 2 | SSOLALM8 | BARL\_FMR1 | BARL | BARL | 1 |
| 2023 | 2 | XBGL88 | BISON\_STRS1\_1 | BISON | STRS | 1 |
| 2023 | 2 | DCC1DUKE | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 1 |
| 2023 | 2 | DLONOR58 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 1 |
| 2023 | 2 | DCHBJO25 | CBYCVN86\_A | CBY | CVN | 1 |
| 2023 | 2 | DBARMAR8 | CKT\_928\_1 | VEGA | BARTON | 1 |
| 2023 | 2 | SCRMSAR8 | CONCHO\_VRBS1\_1 | CONCHO | VRBS | 1 |
| 2023 | 2 | DBIGKEN5 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 1 |
| 2023 | 2 | DLONWEI8 | MCKENZ\_WESTSI1\_1 | MCKENZIE | WESTSIDE | 1 |
| 2023 | 2 | DSLKSOL5 | 138\_BRL\_SDB\_1 | TNBRDRAW | SADLBACK | 1 |
| 2023 | 2 | SMOUJOH8 | 33T218\_1 | WIRTZ | BURNET | 1 |
| 2023 | 2 | BASE CASE | APPALOSA\_TL\_1 | APPALOSA | PALOUSE | 1 |
| 2023 | 2 | SNEDLON5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 1 |
| 2023 | 2 | DMCNDES8 | CKT\_909\_1 | DESSAU | MCNEIL | 1 |
| 2023 | 2 | SCO2EUL8 | COLETO\_ROSATA1\_1 | COLETO | ROSATA | 1 |
| 2023 | 2 | DTWIDIV5 | MADDUX\_SANTIA1\_1 | SANTIAGO | MADDUX | 1 |
| 2023 | 2 | BASE CASE | TRDWEL | n/a | n/a | 1 |
| 2023 | 2 | DBERWE58 | 254T331\_1 | SATTLE | CRANMI | 1 |
| 2023 | 2 | DCAGCO58 | 256T330\_1 | DEVIHI | CRANMI | 1 |
| 2023 | 2 | SGLAGA28 | 33T218\_1 | WIRTZ | BURNET | 1 |
| 2023 | 2 | DELMELM5 | 361T361\_1 | SCHERT | PARKWA | 1 |
| 2023 | 2 | DELMMAR5 | 361T361\_1 | SCHERT | PARKWA | 1 |
| 2023 | 2 | DLYTZOR5 | 402T490\_1 | CANYON | ROHR | 1 |
| 2023 | 2 | DLEGOUT5 | 50\_\_A | BBSES | JEWET | 1 |
| 2023 | 2 | DCAGCO58 | BERGHE\_AT1L | BERGHE | BERGHE | 1 |
| 2023 | 2 | SBE2ASH8 | CARVER\_LVOK1\_1 | LVOK | CARVER | 1 |
| 2023 | 2 | DAJOSTE5 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2023 | 2 | DABPAB98 | CONAN\_SANA1\_1 | SANA\_TAP | CONAN | 1 |
| 2023 | 2 | SBKENSH8 | DA\_WC\_89\_A | WC | DA | 1 |
| 2023 | 2 | DMCEBUT8 | ESKSW\_TRNT1\_1 | ESKSW | TRNT | 1 |
| 2023 | 2 | DRILEDI5 | ESKSW\_TRNT1\_1 | ESKSW | TRNT | 1 |
| 2023 | 2 | MCONQAL5 | HARGRO\_TWINBU1\_1 | TWINBU | HARGROVE | 1 |
| 2023 | 2 | SWHILON5 | PELICA\_WHITE\_1\_1 | PELICAN | WHITE\_PT | 1 |
| 2023 | 2 | SHECWH28 | RINCON\_WHITE\_2\_1 | WHITE\_PT | RINCON | 1 |
| 2023 | 2 | SMGIENW8 | TRU\_UAT1 | TRU | TRU | 1 |
| 2023 | 2 | XWIN58 | WINCHES\_AT2H | WINCHES | WINCHES | 1 |
| 2023 | 2 | MWIRJO28 | 33T218\_1 | WIRTZ | BURNET | 1 |
| 2023 | 2 | DBURBUC8 | 372T359\_1 | GABRIE | GLASSC | 1 |
| 2023 | 2 | UFE2FER1 | 372T359\_1 | GABRIE | GLASSC | 1 |
| 2023 | 2 | DSNG\_TB5 | 667T667\_1 | WARDA | RTOPTA | 1 |
| 2023 | 2 | SSANFOW5 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 1 |
| 2023 | 2 | DCC1DUKE | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2023 | 2 | SSANFOW5 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2023 | 2 | SCISPUT8 | ESTES\_PECAN\_1\_1 | PECAN\_BY | ESTES | 1 |
| 2023 | 2 | SHEICAD8 | G69\_E1B\_1 | NTHSDTAP | TXCITYMN | 1 |
| 2023 | 2 | DCAGTA58 | H3\_K0\_1 | H3 | K0 | 1 |
| 2023 | 2 | SHEICAD8 | HEIGHTTN\_HAT2 | HEIGHTTN | HEIGHTTN | 1 |
| 2023 | 2 | SESCGAN8 | MAXWEL\_WHITIN1\_1 | MAXWELL | WHITING | 1 |
| 2023 | 2 | SWEILON8 | MCKENZ\_WESTSI1\_1 | WESTSIDE | MCKENZIE | 1 |
| 2023 | 2 | DFERWIR8 | SANDCR\_5211 | SANDCR | SANDCR | 1 |
| 2023 | 2 | BASE CASE | X5\_ALAMO1\_1 | OCI\_ALM1 | X5 | 1 |
| 2023 | 2 | DGABGEA8 | 213T378\_1 | RNDRK | CHIEBR | 1 |
| 2023 | 2 | DCAGCI58 | 255T279\_1 | PIPECR | MEDILA | 1 |
| 2023 | 2 | DCRLLSW5 | 588\_A\_1 | LWSVW | LWVTI | 1 |
| 2023 | 2 | DKG\_NB\_5 | BCVLY\_03\_A | BCV | LY | 1 |
| 2023 | 2 | SN\_SLON5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 1 |
| 2023 | 2 | SDAFAUS8 | CKT\_1027\_1 | DUNLAP | DECKER | 1 |
| 2023 | 2 | SHLJSTP5 | CKT\_3124\_1 | STP | HLJ | 1 |
| 2023 | 2 | SCARLVO8 | CONCHO\_SANW0\_1 | CONCHO | SANW | 1 |
| 2023 | 2 | DCALBEC8 | D5\_J0\_1 | J0 | LEON\_CRK | 1 |
| 2023 | 2 | DDOWOAS5 | DA\_WC\_89\_A | WC | DA | 1 |
| 2023 | 2 | SFTLMES8 | PALOUS\_WOLFCA1\_1 | PALOUSE | WOLFCAMP | 1 |
| 2023 | 2 | DHECWHI8 | RINCON\_WHITE\_2\_1 | WHITE\_PT | RINCON | 1 |
| 2023 | 2 | SSPUASP8 | ROBY\_ROTN1\_1 | ROTN | ROBY | 1 |
| 2023 | 2 | SBIGTWI5 | TREADW\_YELWJC1\_1 | TREADWEL | YELWJCKT | 1 |
| 2023 | 2 | SHEICAD8 | TXCITYMN\_TCM1 | TXCITYMN | TXCITYMN | 1 |
| 2023 | 2 | SDIMBEV8 | UVALDE\_W\_BATE1\_1 | W\_BATESV | UVALDE | 1 |
| 2023 | 2 | SSANFER8 | V3\_W1\_1 | V3 | W1 | 1 |
| 2023 | 2 | DFPPHOL5 | WINCHES\_AT2H | WINCHES | WINCHES | 1 |
| 2023 | 2 | SGEOHU48 | 213T378\_1 | RNDRK | CHIEBR | 1 |
| 2023 | 2 | DWCSHCK5 | 35100\_\_A | PKRSW | HCKSW | 1 |
| 2023 | 2 | DFERWIR8 | 40T189\_1 | FERGUS | WIRTZ | 1 |
| 2023 | 2 | DTVWCPS5 | 6000\_\_A | BNBSW | SYCRK | 1 |
| 2023 | 2 | DMGSBIT5 | 6036\_\_A | TKWSW | MGSES | 1 |
| 2023 | 2 | MASHDIL8 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2023 | 2 | DTWIBGL8 | CONCHO\_SANW0\_1 | CONCHO | SANW | 1 |
| 2023 | 2 | SWRDYN8 | EL\_CAM\_LANCTY1\_1 | LANCTYPM | EL\_CAMPO | 1 |
| 2023 | 2 | SMCEESK8 | ESKSW\_TRNT1\_1 | ESKSW | TRNT | 1 |
| 2023 | 2 | DTWIDIV5 | MKLT\_TRNT1\_1 | TRNT | MKLT | 1 |
| 2023 | 2 | SSCLWF28 | NVKSW\_FMR1 | NVKSW | NVKSW | 1 |
| 2023 | 2 | DFRIILL8 | PALOUS\_WOLFCA1\_1 | PALOUSE | WOLFCAMP | 1 |
| 2023 | 2 | DCENRI35 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 1 |
| 2023 | 2 | SSKYSB28 | PECNGRV\_SMIDLA\_1 | PECN\_GRV | SMIDLAND | 1 |
| 2023 | 2 | DWPWFWP5 | STPWAP39\_1 | STP | WAP | 1 |
| 2023 | 2 | DODEMOS5 | 15060\_\_B | VEALMOOR | KOCHTAP | 1 |
| 2023 | 2 | SKEYWLV8 | 15060\_\_B | VEALMOOR | KOCHTAP | 1 |
| 2023 | 2 | DFPPHOL5 | 190T152\_1 | WINCHES | GIDEON | 1 |
| 2023 | 2 | SLOSAUS5 | 197T171\_1 | GIDEON | AUSTRO | 1 |
| 2023 | 2 | SBERBUR8 | 213T378\_1 | RNDRK | CHIEBR | 1 |
| 2023 | 2 | DKENCA58 | 256T330\_1 | DEVIHI | CRANMI | 1 |
| 2023 | 2 | DBERNAR8 | 372T359\_1 | GABRIE | GLASSC | 1 |
| 2023 | 2 | DSALHUT5 | 421\_\_A | BCESW | SNDSW | 1 |
| 2023 | 2 | SNORNEV5 | 718T718\_1 | BAKESW | SOLSTICE | 1 |
| 2023 | 2 | DCAGTA58 | 85T329\_1 | BERGHE | DEVIHI | 1 |
| 2023 | 2 | XBGL88 | BISON\_STRS1\_1 | STRS | BISON | 1 |
| 2023 | 2 | SREVDIL8 | BRUNI\_69\_1 | BRUNI | BRUNI | 1 |
| 2023 | 2 | DKENNO89 | COLETO\_ROSATA1\_1 | COLETO | ROSATA | 1 |
| 2023 | 2 | SCT2CAR8 | ESCOND\_GANSO1\_1 | GANSO | ESCONDID | 1 |
| 2023 | 2 | SHEICAD8 | G69\_E1B\_1 | TXCITYMN | NTHSDTAP | 1 |
| 2023 | 2 | MMGSCON5 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 1 |
| 2023 | 2 | SN\_SAJO5 | LASPUL\_RAYMND1\_1 | LASPULGA | RAYMND2 | 1 |
| 2023 | 2 | DBERWE58 | MOUNTO\_AT1 | MOUNTO | MOUNTO | 1 |
| 2023 | 2 | XWHI58 | NCARBI\_SEADRF1\_1 | NCARBIDE | SEADRFTC | 1 |
| 2023 | 2 | DCENREV5 | PAWNEE\_TANGO1\_1 | TANGO | PAWNEE | 1 |
| 2023 | 2 | DWPWFCK5 | STPWAP39\_1 | STP | WAP | 1 |
| 2023 | 2 | SMAEKEN8 | V3\_W1\_1 | V3 | W1 | 1 |
| 2023 | 2 | SGI2WIN8 | 366T150\_1 | ALUMCR | GIDEON | 1 |
| 2023 | 2 | MMGSCON5 | 6471\_\_A | MGSES | MCDLD | 1 |
| 2023 | 2 | DCRLLSW5 | LWSSW\_FMR2 | LWSSW | LWSSW | 1 |
| 2023 | 2 | SNBTHW5 | THWTAP81\_1 | THW | THW | 1 |
| 2023 | 2 | SWINPAI8 | 190T152\_1 | WINCHES | GIDEON | 1 |
| 2023 | 2 | SWINPAI8 | 366T150\_1 | ALUMCR | GIDEON | 1 |
| 2023 | 2 | SFERFER8 | 372T359\_1 | GABRIE | GLASSC | 1 |
| 2023 | 2 | SMAEKEN8 | 460T460\_1 | W1 | MEDILA | 1 |
| 2023 | 2 | DSCOTKW5 | 6474\_\_A | SUNSW | MGSES | 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: 11,460 MW on 02/17/2023 at 14:52| Current Solar Penetration Record: 26/78% on 02/11/2023 at 15:49 [↑](#footnote-ref-1)
2. This is the hourly integrated peak demand as published in the ERCOT D&E report. [↑](#footnote-ref-2)
3. 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-3)
4. See DC Tie Operating Procedure (<http://www.ercot.com/mktrules/guides/procedures>) for more details. [↑](#footnote-ref-4)