

March 2024 ERCOT Monthly Operations Report

Reliability and Operations Subcommittee Meeting

May 02, 2024

Table of Contents

[1. Report Highlights 2](#_Toc162526249)

[2. Frequency Control 3](#_Toc162526250)

[2.1. Frequency Events 3](#_Toc162526251)

[2.2. ERCOT Contingency Reserve Events 4](#_Toc162526252)

[2.3. Responsive Reserve Events 4](#_Toc162526253)

[2.4. Load Resource Events 5](#_Toc162526254)

[3. Reliability Unit Commitment 5](#_Toc162526255)

[4. IRR, Wind, and Solar Generation as a Percent of Load 5](#_Toc162526256)

[5. Largest Net-Load Ramps 7](#_Toc162526257)

[6. Congestion Analysis 8](#_Toc162526258)

[6.1. Notable Constraints 8](#_Toc162526259)

[6.2. Generic Transmission Constraint Congestion 17](#_Toc162526260)

[6.3. Manual Overrides 17](#_Toc162526261)

[6.4. Congestion Costs for Calendar Year 2024 17](#_Toc162526262)

[7. System Events 18](#_Toc162526263)

[7.1. ERCOT Peak Load 18](#_Toc162526264)

[7.2. Load Shed Events 19](#_Toc162526265)

[7.3. Stability Events 19](#_Toc162526266)

[7.4. Notable PMU Events 19](#_Toc162526267)

[7.5. DC Tie Curtailment 19](#_Toc162526268)

[7.6. TRE/DOE Reportable Events 19](#_Toc162526269)

[7.7. New/Updated Constraint Management Plans 19](#_Toc162526270)

[7.8. New/Modified/Removed RAS 19](#_Toc162526271)

[7.9. New Procedures/Forms/Operating Bulletins 20](#_Toc162526272)

[8. Emergency Conditions 20](#_Toc162526273)

[8.1. OCNs 20](#_Toc162526274)

[8.2. Advisories 20](#_Toc162526275)

[8.3. Watches 20](#_Toc162526276)

[8.4. Emergency Notices 20](#_Toc162526277)

[9. Application Performance 20](#_Toc162526278)

[9.1. TSAT/VSAT Performance Issues 20](#_Toc162526279)

[9.2. Communication Issues 20](#_Toc162526280)

[9.3. Market System Issues 20](#_Toc162526281)

[10. Model Updates 21](#_Toc162526282)

[Appendix A: Real-Time Constraints 22](#_Toc162526283)

# Report Highlights

* The unofficial ERCOT peak demand was 55,298 MW for the month of March on 03/05/2024 HE 17:00; this is 2,204 MW higher than the March 2023 peak demand of 53,094 MW on 03/31/2023 HE 18:00.
* A PVGR generation record of 18,881 MW was set on 03/28/2024 at 11:24.
* A PVGR penetration record of 42.98% was set on 03/28/2024 at 11:27.
* A renewable penetration record of 75.67% was set on 03/29/2024 at 14:13.
* There were 3 frequency events.
* There were 3 ERCOT Contingency Reserve Service (ECRS) events.
* There was no instance where Responsive Reserve Service (RRS) was deployed.
* There was 1 Advisory issued for a geomagnetic disturbance of K-Index level 8/NOAA Scale level G4 on 03/25/2024.
* There were 2 DC Tie curtailments.
* There were 18 HRUC commitments.
* There were 27 days congestion on Hamilton GTC, 22 days on Zapata Starr GTC, 22 days on North Edinburg to Lobo GTC, 22 days on Panhandle GTC, 19 days on Valley Export GTC, 18 days on West Texas Export GTC, 11 days on East Texas GTC, 10 days on Kinney GTC, 10 days on E\_PATA GTC, 9 days on Nelson Sharpe to Rio Hondo GTC, 8 days on I\_KALO, 7 days on North to Houston GTC, 5 days on E\_PASP GTC, 2 days on I\_PASP, and 1 day on McCamey GTC. There was no activity on the remaining GTCs during the month.

# Frequency Control

## Frequency Events

The ERCOT Interconnection experienced 3 frequency events, which resulted from units tripping. The average event duration was 00:04:32.

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)** | **%**  | **(MW-s)** |
| 3/6/2024 16:11:49 | 0.055 | 59.914 | 00:03:47 | 0.68 | 10% | 434 | 52,314  | 36% | 254,721  |
| 3/12/2024 8:16:53 | 0.120 | 59.853 | 00:07:14 | 0.87 | 15% | 819 | 43,332  | 56% | 167,898  |
| 3/17/2024 15:16:25 | 0.085 | 59.871 | 00:02:36 | 0.67 | 11% | 644 | 43,859  | 34% | 224,994  |



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

## ERCOT Contingency Reserve Events

There were 3 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** |
| 3/4/2024 18:31 | 3/4/2024 19:20 | 0:49:40 | 550 | Insufficient Capacity for projected netload ramp |
| 3/12/2024 8:17 | 3/12/2024 8:24 | 0:07:44 | 904 | Unit Trip |
| 3/17/2024 15:16 | 3/17/2024 15:19 | 0:03:12 | 820 | Unit Trip |

## Responsive Reserve Events

There were 0 events where Responsive Reserve MWs were released to SCED.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date and Time Released to SCED** | **Date and Time Recalled** | **Duration of Event** | **Maximum MWs Released** | **Comments** |
| N/A | N/A | N/A | N/A | N/A |

## 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 18 HRUC commitments.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Resource Location** | **# of Resources** | **Operating Day** | **Total # of Hours Committed** | **Total MWhs** | **Reason for Commitment** |
|  SOUTHERN  | 1 | March 2, 2024 | 17 | 6,975 |  System Reliability  |
|  SOUTHERN  | 1 | March 3, 2024 | 24 | 6,000 |  System Reliability  |
|  NORTH\_CENTRAL, SOUTH\_CENTRAL, SOUTHERN  | 4 | March 4, 2024 | 28 | 6,266 |  Capacity, System Reliability  |
|  COAST, NORTH\_CENTRAL  | 3 | March 5, 2024 | 21 | 5,472 |  Capacity, Contingency Management  |
|  COAST  | 1 | March 6, 2024 | 24 | 13,728 |  Minimum Runtime Requirement  |
|  COAST  | 1 | March 7, 2024 | 24 | 13,728 |  Minimum Runtime Requirement  |
|  COAST  | 1 | March 8, 2024 | 24 | 13,728 |  Minimum Runtime Requirement  |
|  COAST  | 1 | March 9, 2024 | 24 | 13,728 |  Minimum Runtime Requirement  |
|  COAST  | 1 | March 10, 2024 | 15 | 8,580 |  Minimum Runtime Requirement  |
|  COAST, NORTH\_CENTRAL  | 4 | March 21, 2024 | 23 | 1,537 |  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-2). Maximum IRR penetration for the month was 75.67% on 03/29/2024 interval ending 14:10 and minimum IRR penetration for the month was 5.44% on 03/22/2024 interval ending 04:20.



During the hour of peak load for the month, hourly integrated wind generation was 20,065 MW and solar generation was 1,470 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 March 2024 is 1,621 MW, 2,493 MW, 3,453 MW, 6,685 MW, and 12,831 MW, respectively. The comparison with respect to the historical values is given in the table belo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Month and Year** | **5 min** | **10 min** | **15 min** | **30 min** | **60 min** |
| Mar-14 | 822 MW | 1,381 MW | 1,895 MW | 3,237 MW | 5,257 MW |
| Mar-15 | 956 MW | 1,615 MW | 2,146 MW | 3,341 MW | 5,661 MW |
| Mar-16 | 979 MW | 1,635 MW | 2,149 MW | 2,967 MW | 5,070 MW |
| Mar-17 | 888 MW | 1,522 MW | 1,838 MW | 3,321 MW | 5,395 MW |
| Mar-18 | 1,375 MW | 1,688 MW | 2,069 MW | 3,576 MW | 5,957 MW |
| Mar-19 | 919 MW | 1,511 MW | 1,932 MW | 3,194 MW | 5,596 MW |
| Mar-20 | 979 MW | 1,406 MW | 1,650 MW | 2,642 MW | 4,660 MW |
| Mar-21 | 926 MW | 1,556 MW | 1,945 MW | 3,282 MW | 6,104 MW |
| Mar-22 | 1,192 MW | 2,155 MW | 3,015 MW | 5,714 MW | 10,750 MW |
| Mar-23 | 1,108 MW | 1,676 MW | 2,204 MW | 4,228 MW | 7,231 MW |
| 3/17/2023 | 3/24/2023 | 3/17/2023 | 3/18/2023 | 3/18/2023 |
| (IE 06:03) | (IE 06:07) | (IE 06:13) | (IE 19:12) | (IE 19:22) |
| Mar-24 | 1,621 MW | 2,493 MW | 3,453 MW | 6,685 MW | 12,831 MW |
| 3/25/2024 | 3/9/2024 | 3/9/2024 | 3/9/2024 | 3/9/2024 |
| (IE 12:31) | (IE17:34) | (IE 17:41) | (IE 17:54) | (IE 19:12) |
| All Months in 2014-2024 | 1,722 MW | 3,107 MW | 4,588 MW | 8,901 MW | 16,522 MW |
| 1/29/2024 | 1/29/2024 | 1/29/2024 | 1/29/2024 | 1/29/2024 |
| (IE 17:02) | (IE 17:05) | (IE 17:10) | (IE 17:11) | (IE 17:17) |

# 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** | **Contingency Name** | **Overloaded Element** | **# of Days Constraint Binding** | **Congestion Rent** | **Transmission Project** |
|  |
| DMGSBTR5 | 6036\_\_A | MGSES TO CCRSW 345 AND BTRCK TO MGSES 345 DBLCKT | Tonkawa Switch - Morgan Creek Ses 345kV | 27 | $58,778,687.67 |  |  |
| SBAKCED5 | HARGRO\_TWINBU1\_1 | BAKERSFIELD SWITCHYARD to CEDAR CANYON LIN 1 | Hargrove - Twin Buttes 138kV | 13 | $17,222,807.40 |  |  |
| SBWDDBM5 | LPLNW\_LPLMD\_1 | BLACKWATER DRAW SWITCH to DOUBLE MOUNTAIN SWITCH LIN 1 | Northwest Substation - Mcdonald Substation 115kV | 11 | $16,882,299.92 |  |  |
| BASE CASE | WESTEX | Basecase | WESTEX GTC | 16 | $12,188,147.18 |  |  |
| BASE CASE | EASTEX | Basecase | EASTEX GTC | 10 | $8,099,495.88 |  |  |
| DBOGPIR8 | BT\_MLR88\_A | TWR(138) BOG - DER 85 & EAB - PIR 88 | Baytown - Miller 138kV | 3 | $7,566,947.31 |  |  |
| DMGSBIT5 | 6036\_\_A | CCRSW TO SWESW 345 AND BTRCK TO MGSES 345 DBLCKT | Tonkawa Switch - Morgan Creek Ses 345kV | 10 | $6,185,033.55 |  |  |
| XFOW58 | LARDVN\_LASCRU1\_1 | FOWLERTON TRX FOWLRTON\_AUTO1 345/138 | Laredo Vft North - Las Cruces 138kV | 21 | $4,800,983.73 |  |  |
| SWIRJOH8 | 55T207\_1 | WIRTZ to JOHNSON CITY LIN 1 | Gillespie - Wolf Creek 138kV | 5 | $3,962,724.77 |  |  |
| DCONLNG5 | 6046\_\_A | CONSW-MGSES\_and\_CONSW-LNGSW\_345kV\_DBLCKT | Falcon Seaboard - Morgan Creek Ses 345kV | 8 | $3,896,983.36 |  |  |
| DKG\_NB\_5 | BCVPSA03\_A | TWR(345) JOR-KG97 & JOR-NB99 | Bigvue - Power Systems Arco Cogen 138kV | 5 | $3,566,470.11 |  |  |
| BASE CASE | PNHNDL | Basecase | PNHNDL GTC | 17 | $3,478,904.76 |  |  |
| DSWECCR5 | 6036\_\_A | SWESW TO BTRCK AND SWESW TO CCRSW 345 DBLCKT | Tonkawa Switch - Morgan Creek Ses 345kV | 5 | $3,335,590.71 |  |  |
| DCONLNG5 | BAKRFLD\_CEDCAN\_1 | CONSW-MGSES\_and\_CONSW-LNGSW\_345kV\_DBLCKT | Cedar Canyon - Bakersfield 345kV | 7 | $2,824,534.61 |  |  |
| MXWHI89 | HECKER\_WHITE\_2\_1 | WHITEPOINT TRX 69A1 138/69 | Hecker - Whitepoint 138kV | 19 | $2,804,180.97 |  |  |
| MFOWLOB5 | LARDVN\_LASCRU1\_1 | manual FOWL RTON to LOBO 345 KV | Laredo Vft North - Las Cruces 138kV | 13 | $2,725,134.64 |  |  |
| BASE CASE | NE\_LOB | Basecase | NE\_LOB GTC | 19 | $2,420,051.08 | The Lower Rio Grande Valley (LRGV) System Enhancement Project (21RPG017) will improve the NorthEd\_LoboGTC to support up to 80% of total wind and solar generation capacity in the LRGV area. |  |
| MRESMCM8 | RINCON\_WHITE\_2\_1 | Manual for I\_DUPS - RESNIK & MCCAMPBE 2 138KV | Whitepoint - Rincon 138kV | 6 | $2,141,372.80 |  |  |
| DNOESGT5 | HARGRO\_TWINBU1\_1 | NOELKE - SINGLE TREE & NOELKE- SINGLE TREE 2 | Hargrove - Twin Buttes 138kV | 3 | $2,004,535.09 |  |  |
| SSTILOM8 | LA\_PAL\_VCAVAZ1\_1 | STILLMAN to LOMA ALTA SUBSTATION LIN 1 | La Palma - Villa Cavazos 138kV | 3 | $1,918,701.07 |  |  |
| DCONLNG5 | 15060\_\_B | CONSW-MGSES\_and\_CONSW-LNGSW\_345kV\_DBLCKT | Koch Tap - Vealmoor 138kV | 7 | $1,825,346.75 |  |  |
| SNEDSTE5 | BURNS\_RIOHONDO\_1 | NORTH EDINBURG to NORTH EDINBURG LIN 1 | Burns Sub - Rio Hondo 138kV | 4 | $1,714,756.13 |  |  |
| DMGSCON5 | 14030\_\_B | MGSES-LNGSW\_and\_MGSES-CONSW\_345\_DBLCKT | Morgan Creek Ses - Moser Canyon Pod 138kV | 1 | $1,603,956.29 |  |  |
| DSALKLN5 | 630\_\_B | SALSW TO KLNSW 345 DBLCKT | Harker Heights South - Killeen Switch 138kV | 7 | $1,593,474.16 |  |  |
| MHARNED5 | BURNS\_RIOHONDO\_1 | Manual dbl ckt for NEDIN-BONILLA 345kV & RIOH-PRIM138kV | Burns Sub - Rio Hondo 138kV | 14 | $1,429,573.56 |  |  |
| DELMSAN5 | BLESSI\_LOLITA1\_1 | Elmcreek-Sanmigl 345kV | Blessing - Lolita 138kV | 2 | $1,425,561.97 |  |  |
| SBAKCED5 | 6056\_\_A | BAKERSFIELD SWITCHYARD to CEDAR CANYON LIN 1 | Longshore Switch - Consavvy Switch 345kV | 9 | $1,386,253.72 |  |  |
| BASE CASE | VALEXP | Basecase | VALEXP GTC | 15 | $1,286,530.81 | The Lower Rio Grande Valley (LRGV) System Enhancement Project (21RPG017) will improve but not eliminate the need for this GTC. |  |
| DBIGSCH5 | BAKRFLD\_CEDCAN\_1 | Big Hill - Schneeman Draw & Big Hill - Schneeman Draw 2 | Cedar Canyon - Bakersfield 345kV | 9 | $1,285,827.83 |  |  |
| BASE CASE | I\_KALO | Basecase | I\_KALO GTC | 5 | $1,263,002.24 |  |  |
| DLWSRNK5 | 587\_\_A | LWSSW TO RNKSW AND LWSSW TO KRWSW 345 DBLCKT | Argyle - Highlands Tnp 138kV | 6 | $1,220,959.18 |  |  |
| XFOW58 | CATARI\_PILONC1\_1 | FOWLERTON TRX FOWLRTON\_AUTO1 345/138 | Catarina - Piloncillo 138kV | 4 | $1,165,015.91 | AEP\_TCC\_AshertontoPiloncillo138kVLine\_rebuild (73100) |  |
| DFOWSMG5 | CATARI\_PILONC1\_1 | FOWLRTON TO SAN MIGUEL DOUBLE CIRCUIT CONTINGENCY | Catarina - Piloncillo 138kV | 6 | $1,122,529.56 | AEP\_TCC\_AshertontoPiloncillo138kVLine\_rebuild (73100) |  |
| MHARNED5 | HAINE\_\_LA\_PAL1\_1 | Manual dbl ckt for NEDIN-BONILLA 345kV & RIOH-PRIM138kV | Haine Drive - La Palma 138kV | 15 | $1,058,970.80 |  |  |
| DBLBYWF5 | JCKSTP18\_A | TWR (345) BLU-BLY72 & HLJ-WLF64 | Jones Creek - South Texas Project 345kV | 3 | $1,042,904.83 |  |  |
| SHLJSTP5 | CKT\_3124\_1 | HILLJE to HILLJE LIN A | Hillje - South Texas Project 345kV | 3 | $1,006,798.34 |  |  |
| DNOECED5 | HARGRO\_TWINBU1\_1 | NOELKE - CEDAR CANYON & NOELKE- CEDAR CANYON 2 | Hargrove - Twin Buttes 138kV | 5 | $972,643.94 |  |  |
| DFOWSMG5 | LARDVN\_LASCRU1\_1 | FOWLRTON TO SAN MIGUEL DOUBLE CIRCUIT CONTINGENCY | Laredo Vft North - Las Cruces 138kV | 4 | $904,752.22 |  |  |
| DBIGKEN5 | HAMILT\_MAVERI1\_1 | Bighil-Kendal 345kV | Hamilton Road - Maverick 138kV | 7 | $839,133.48 | Escondido to Hamilton Road 138 kV Line Rebuild Project (22RPG044) |  |
| BASE CASE | ZAPSTR | Basecase | ZAPSTR GTC | 20 | $802,515.32 |  |  |
| DBIGKEN5 | HAMILT\_MAXWEL1\_1 | Bighil-Kendal 345kV | Hamilton Road - Maxwell 138kV | 14 | $750,870.18 | Hamilton Road to Maxwell 138 kV Line Rebuild Project(20RPG022) |  |
| DELMSAN5 | COLETO\_VICTOR2\_1 | Elmcreek-Sanmigl 345kV | Coleto Creek - Victoria 138kV | 4 | $666,154.57 |  |  |
| DCONLNG5 | 14040\_\_A | CONSW-MGSES\_and\_CONSW-LNGSW\_345kV\_DBLCKT | Polecat Creek Switch - Dewey Lake Tap 138kV | 8 | $582,945.08 | Oncor\_FW\_45640\_Spraberry - Polecat Creek 138 kV Line(23RPG009, MOD 45640) |  |
| SFORYEL8 | HEXT\_MASONS1\_1 | FORT MASON to FORT MASON LIN 1 | Mason Switching Station - Hext Lcra 69kV | 12 | $578,135.73 |  |  |
| SBAKCED5 | CEDRHI\_SILT1\_1 | BAKERSFIELD SWITCHYARD to CEDAR CANYON LIN 1 | Cedar Hills - Silver Tap 69kV | 4 | $533,582.93 | AEP\_TNC\_Cedar\_Hill\_Relay\_Upgrade (72213) |  |
| MNEDPOM5 | FREER\_LOBO1\_1 | Double Manual NORTH EDINBURG TO POMELO LIN 1&2 345 kV | Lobo - Freer 69kV | 6 | $433,881.33 |  |  |
| SFORYEL8 | MASNPH\_MASN1\_1 | FORT MASON to FORT MASON LIN 1 | Mason Aep - Mason Phillips Tap 69kV | 8 | $388,300.49 |  |  |
| DBIGKEN5 | CARVER\_TINSLE1\_1 | Bighil-Kendal 345kV | Carver - Tinsley Tap 138kV | 7 | $387,874.47 |  |  |
| SCARFRI8 | ATSO\_SONR1\_1 | Carver to Carver LIN 1 | Atlantic Sonora - Sonora 69kV | 6 | $384,218.69 |  |  |
| DCAGCI58 | 255T279\_1 | Cagnon-Kendal 345 &Cico-Mengcr 138 | Medina Lake - Pipe Creek 138kV | 5 | $378,872.99 |  |  |
| DCONLNG5 | 6095\_\_D | CONSW-MGSES\_and\_CONSW-LNGSW\_345kV\_DBLCKT | Lamesa - Jim Payne Poi 138kV | 7 | $370,805.01 |  |  |
| BASE CASE | E\_PATA | Basecase | E\_PATA GTC | 9 | $360,510.99 |  |  |
| DELMSAN5 | OAKS9\_69\_1 | Elmcreek-Sanmigl 345kV | Oaks Sub 138kV | 3 | $346,722.83 |  |  |
| DBIGKEN5 | CAMPWO\_NEWBAR1\_1 | Bighil-Kendal 345kV | New Barksdale - Campwood 69kV | 4 | $335,941.04 |  |  |
| SBRAPIN8 | HAMILT\_MAVERI1\_1 | BRACKETTVILLE to BRACKETTVILLE LIN 1 | Hamilton Road - Maverick 138kV | 12 | $301,826.88 | Escondido to Hamilton Road 138 kV Line Rebuild Project (22RPG044) |  |
| MNEDPOM5 | BURNS\_RIOHONDO\_1 | Double Manual NORTH EDINBURG TO POMELO LIN 1&2 345 kV | Burns Sub - Rio Hondo 138kV | 3 | $234,637.43 |  |  |
| DBIGKEN5 | GANSO\_MAVERI1\_1 | Bighil-Kendal 345kV | Ganso - Maverick 138kV | 4 | $223,449.66 |  |  |
| SSHKCRI8 | 940\_\_A | ENNIS to ENNIS LIN 1 | Ennis West Switch - Templeton 138kV | 8 | $221,338.81 | Oncor\_ME\_71156\_Ennis West Switch-Waxahachie Switch 138 kV Line (71156) |  |
| DWLFMOS5 | 6520\_\_E | WLFSW-MOSSW 345&WLFSW-ODEHV 345\_\_\_\_TRPLCKT-1of3 | Odessa Ehv Switch - Yarbrough Sub 138kV | 6 | $219,878.65 |  |  |
| DCAGCI58 | 415T415\_1 | Cagnon-Kendal 345 &Cico-Mengcr 138 | Miller Creek - Henly 138kV | 6 | $211,350.63 |  |  |
| SCOLBAL8 | BALLIN\_HUMBLT1\_1 | COLEMAN LAKE IVIE TAP to COLEMAN LAKE IVIE TAP LIN 1 | Ballinger - Ballinger Humble Tap 69kV | 4 | $206,084.01 |  |  |
| DBERWE58 | 415T415\_1 | Berghe-Kendal 345kv & Welfar 138kv | Miller Creek - Henly 138kV | 8 | $187,089.31 |  |  |
| SFORYEL8 | HEXT\_YELWJC1\_1 | FORT MASON to FORT MASON LIN 1 | Yellow Jacket - Hext Lcra 69kV | 15 | $178,148.07 |  |  |
| DSALHUT5 | 270\_\_A | SALSW - HUTTO 345KV | Temple Switch - Knob Creek Switch 345kV | 6 | $166,307.72 |  |  |
| DDILCOT8 | DILLEYSW\_69A1 | Dilleysw-Sanmgsw&Cotulas 138kV | Dilley Switch Aep 138kV | 15 | $161,092.23 |  |  |
| SCRMSAR8 | CONCHO\_VRBS1\_1 | SAN ANGELO RED CREEK to Weiss LIN 1 | San Angelo Concho - Veribest 69kV | 5 | $159,045.64 |  |  |
| DCAGCO58 | 656T656\_1 | Cagnon-Kendal 345 & Cico-Comfor 138 | Bergheim - Kendall 345kV | 5 | $152,115.72 |  |  |
| BASE CASE | KINNEY | Basecase | KINNEY GTC | 10 | $138,451.20 |  |  |
| DBIGSCH5 | PALOUS\_WOLFCA1\_1 | Big Hill - Schneeman Draw & Big Hill - Schneeman Draw 2 | Palouse - Wolfcamp 138kV | 4 | $137,011.98 |  |  |
| SN\_SLON5 | N\_SHARPE\_XF1 | LON HILL to NELSON SHARPE LIN 1 | Nelson Sharpe 345kV | 10 | $136,802.45 |  |  |
| SDBMFID5 | LPLWA\_LPLDB\_1 | DOUBLE MOUNTAIN SWITCH to DOUBLE MOUNTAIN SWITCH LIN 1 | Wadsworth Susbsation - Dunbar Substation 115kV | 3 | $136,710.76 |  |  |
| DCAGCO58 | 583T583\_1 | Cagnon-Kendal 345 & Cico-Comfor 138 | Mason Creek - Bandera 138kV | 3 | $121,025.63 |  |  |
| DBBSJEW5 | 1240\_\_E | BBSES TO JEWET 345 DBLCKT | Fairfield West - Fairfield Bepc 138kV | 3 | $113,132.25 |  |  |
| SOBWAP5 | OB\_WAP98\_A | WA PARISH to OBRIEN LIN A | Wa Parish - Obrien 345kV | 3 | $101,855.62 |  |  |
| DBLHJWF5 | JCKSTP18\_A | TWR (345) BLU-HLJ72 & HLJ-WLF64 | Jones Creek - South Texas Project 345kV | 3 | $85,577.10 |  |  |
| SBRAHAM8 | HAMILT\_MAVERI1\_1 | BRACKETTVILLE to HAMILTON ROAD LIN 1 | Hamilton Road - Maverick 138kV | 3 | $74,126.58 | Escondido to Hamilton Road 138 kV Line Rebuild Project (22RPG044) |  |
| DELMSAN5 | BEEVIL\_NORMAN1\_1 | Elmcreek-Sanmigl 345kV | Beeville - Normanna 69kV | 3 | $72,112.77 |  |  |
| BASE CASE | HMLTN | Basecase | HMLTN GTC | 26 | $61,545.77 |  |  |
| SHAYZO25 | 6T227\_1 | HAYS ENERGY to ZORN LIN 1 | Zorn - Hays Energy 345kV | 4 | $46,604.37 |  |  |
| SMV\_PAR8 | RIOHND\_ERIOHND\_1 | CENTRAL AVENUE SUB to CENTRAL AVENUE SUB LIN 1 | Rio Hondo - East Rio Hondo Sub 138kV | 4 | $41,888.33 | STEC\_6687\_RebuildRioHondo-ERioHondo (6687) |  |
| DBIGKEN5 | TREADW\_YELWJC1\_1 | Bighil-Kendal 345kV | Yellow Jacket - Treadwell 138kV | 5 | $37,094.89 |  |  |
| DCAGCO58 | 415T415\_1 | Cagnon-Kendal 345 & Cico-Comfor 138 | Miller Creek - Henly 138kV | 3 | $35,789.52 |  |  |
| SMADSAP8 | MADDUX\_SAPOWE2\_1 | MADDUX to SAN ANGELO POWER STATION LIN 1 | Maddux - San Angelo Power Station 138kV | 7 | $34,284.43 |  |  |
| SBTPBNT8 | MYRA\_VAL\_1 | BENNETT ROAD SWITCH to WISE COUNTY LIN \_B | Myra - Valley View Bepc 138kV | 3 | $31,210.68 |  |  |
| SCONMGS5 | 6056\_\_A | CONSAVVY SWITCH to CONSAVVY SWITCH LIN \_A | Longshore Switch - Consavvy Switch 345kV | 3 | $28,699.54 |  |  |
| BASE CASE | N\_TO\_H | Basecase | N\_TO\_H GTC | 3 | $21,932.89 |  |  |
| BASE CASE | NELRIO | Basecase | NELRIO GTC | 6 | $16,288.63 | The Lower Rio Grande Valley (LRGV) System Enhancement Project (21RPG017) will cause there to be no stability constraint for NelsonSharpe\_RioHondoGTC under normal conditions. |  |
| BASE CASE | T-315\_1 | Basecase | Mhos - Jade Solar 345kV | 3 | $15,307.27 |  |  |
| SRAYRI38 | RAY\_MV\_R\_1 | LAS PULGAS to RAYMONDVILLE 2 LIN 1 | Raymondville 2 - Raymondville Tap 138kV | 3 | $14,001.21 |  |  |
| SMOUJOH8 | 55T207\_1 | JOHNSON CITY to MOUNTAIN TOP LIN 1 | Gillespie - Wolf Creek 138kV | 4 | $13,398.22 |  |  |
| SKLELOY8 | LOYOLA\_69\_1 | KLEBERG AEP to KLEBERG AEP LIN 1 | Loyola Sub 138kV | 4 | $11,442.12 | STEC\_76816\_upgradeLoyolaAuto (76816) |  |
| SBRAUVA8 | BRACKE\_ESCOND1\_1 | ODLAW SWITCH to ASPHALT MINES LIN 1 | Brackettville - Escondido 138kV | 3 | $9,028.47 |  |  |
| XFTS89 | ALPINE\_BRONCO1\_1 | FORT STOCKTON PLANT TRX 69T1 138/69 | Alpine - Bronco 69kV | 3 | $5,954.85 |  |  |
| SN\_SAJO5 | LASPUL\_RAYMND1\_1 | AJO to AJO LIN 1 | Las Pulgas - Raymondville 2 138kV | 4 | $5,088.56 |  |  |
| SBRAPIN8 | ESCOND\_GANSO1\_1 | BRACKETTVILLE to BRACKETTVILLE LIN 1 | Escondido - Ganso 138kV | 4 | $3,427.41 | Escondido to Hamilton Road 138 kV Line Rebuild Project (22RPG044) |  |
| SMCEABS8 | MKLT\_TRNT1\_1 | ABILENE SOUTH to ABILENE SOUTH LIN 1 | Merkel Tap - Trent 69kV | 4 | $702.00 |  |  |
| SMCEESK8 | MKLT\_TRNT1\_1 | MCELMURRAY to ESKOTA SWITCH LIN 1 | Merkel Tap - Trent 69kV | 3 | $582.28 |  |  |

## Generic Transmission Constraint Congestion

There were 27 days congestion on Hamilton GTC, 22 days on Zapata Starr GTC, 22 days on North Edinburg to Lobo GTC, 22 days on Panhandle GTC, 19 days on Valley Export GTC, 18 days on West Texas Export GTC, 11 days on East Texas GTC, 10 days on Kinney GTC, 10 days on E\_PATA GTC, 9 days on Nelson Sharpe to Rio Hondo GTC, 8 days on I\_KALO, 7 days on North to Houston GTC, 5 days on E\_PASP GTC, 2 days on I\_PASP, and 1 day on McCamey 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

There were no overrides for the month of March.

## Congestion Costs for Calendar Year 2024

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)** |
| MGSES TO CCRSW 345 AND BTRCK TO MGSES 345 DBLCKT | Tonkawa Switch - Morgan Creek Ses 345kV | 6409 | $74,709,012.69 |
| BAKERSFIELD SWITCHYARD to CEDAR CANYON LIN 1 | Hargrove - Twin Buttes 138kV | 4828 | $37,896,176.35 |
| Basecase | WESTEX GTC | 7982 | $34,037,752.91 |
| BLACKWATER DRAW SWITCH to DOUBLE MOUNTAIN SWITCH LIN 1 | Northwest Substation - Mcdonald Substation 115kV | 3046 | $17,562,976.95 |
| Basecase | PNHNDL GTC | 9825 | $13,080,671.27 |
| HCKSW TO ALLNC 345 AND HCKSW TO RNKSW 345 DBLCKT | Eagle Mountain Ses 345kV | 439 | $11,753,026.97 |
| EVERMAN SWITCH TRX EVRSW\_4\_1 345/138 | Everman Switch 345kV | 386 | $11,447,643.03 |
| CONSW-MGSES\_and\_CONSW-LNGSW\_345kV\_DBLCKT | Falcon Seaboard - Morgan Creek Ses 345kV | 4011 | $9,203,020.23 |
| KENDALL to COMFORT LIN 1 | Kerrville Stadium - Kendall 138kV | 402 | $8,721,663.50 |
| Basecase | EASTEX GTC | 104 | $8,611,929.11 |
| COMAL to HENNE LIN 1 | Mccarty Lane - Zorn 138kV | 211 | $8,348,025.83 |
| CCRSW TO SWESW 345 AND BTRCK TO MGSES 345 DBLCKT | Tonkawa Switch - Morgan Creek Ses 345kV | 5290 | $7,691,947.59 |
| TWR(138) BOG - DER 85 & EAB - PIR 88 | Baytown - Miller 138kV | 361 | $7,566,947.31 |
| FOWLERTON TRX FOWLRTON\_AUTO1 345/138 | Laredo Vft North - Las Cruces 138kV | 3553 | $7,120,740.18 |
| Basecase | NE\_LOB GTC | 8521 | $6,593,392.56 |
| FOWLRTON TO SAN MIGUEL DOUBLE CIRCUIT CONTINGENCY | Catarina - Piloncillo 138kV | 1440 | $6,530,228.31 |
| CONSW-MGSES\_and\_CONSW-LNGSW\_345kV\_DBLCKT | Polecat Creek Switch - Dewey Lake Tap 138kV | 2875 | $6,405,127.04 |
| KENEDSW - TULETA (138) & PETTUS - NORMANNA (69) | Coleto Creek - Rosata Tap 138kV | 513 | $6,071,941.17 |
| MVEC (RANGERVILLE) to LA PALMA LIN 1 | Stewart Road - Vertrees 138kV | 260 | $5,900,076.10 |
| manual George West Switching Station TRX 69\_1 138/69 (outage on bkr 14164) | Orange Grove Switching Station 138kV | 392 | $5,671,797.70 |

# System Events

## ERCOT Peak Load

The unofficial ERCOT peak load for the month was 55,298 MW and occurred on 03/05/2024, 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-3),[[3]](#footnote-4)** |
| 3/2/2024 | DC\_R | 00:37 – 02:07 | 2 | Forced Outage |  |
| 3/5/2024 | DC\_R | 17:30 – 20:04 | 4 | Derate due to Cenace |  |

## TRE/DOE Reportable Events

* ONCOR Submitted a EOP-004-4 on 03/14/2024 for Damage or Destruction of a Facility
* CenterPoint Submitted a DOE-417 on 03/22/2024 for Loss of electric service to more than 50,000 customers for 1 hour or more.
* AEP Submitted a DOE-417 on 03/23/2024 for Damage or Destruction of a Facility
* CenterPoint Submitted a DOE-417 on 03/25/2024 for Complete loss of monitoring for 30 continuous minutes or more.

## New/Updated Constraint Management Plans

One mitigation plan modified: MP\_2011\_08 Rev 31.

## New/Modified/Removed RAS

None.

## New Procedures/Forms/Operating Bulletins

|  |  |  |
| --- | --- | --- |
| **Date** | **Subject** | **Bulletin No.** |
| 03/28/2024 | Transmission and Security Desk V1 Rev 108 | 1136 |
| 03/28/2024 | Shift Supervisor Desk V1 Rev 9 | 1134 |
| 03/28/2024 | Scripts V1 Rev 56 | 1135 |

# Emergency Conditions

## OCNs

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

## Advisories

|  |  |
| --- | --- |
| **Date and Time** | **Message** |
| Mar 24, 2024 14:56 CST | Advisory issued for a geomagnetic disturbance of K-Index level 8/NOAA Scale level G4 until 03/25/20204 at 06:00UTC |

## Watches

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

## Emergency Notices

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

# 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 one-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 | 0 |
| LCRA TRANSMISSION SERVICES CORPORATION (TDSP) | 0 |
| LONE STAR TRANSMISSION LLC (TSP) | 0 |
| ONCOR ELECTRIC DELIVERY COMPANY LLC (TDSP) | 0 |
| 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 |
| 2024 | 3 | DMGSBTR5 | 6036\_\_A | TKWSW | MGSES | 29 |
| 2024 | 3 | BASE CASE | HMLTN | n/a | n/a | 27 |
| 2024 | 3 | DMGSBIT5 | 6036\_\_A | TKWSW | MGSES | 27 |
| 2024 | 3 | BASE CASE | PNHNDL | n/a | n/a | 22 |
| 2024 | 3 | BASE CASE | ZAPSTR | n/a | n/a | 22 |
| 2024 | 3 | BASE CASE | NE\_LOB | n/a | n/a | 22 |
| 2024 | 3 | MXWHI89 | HECKER\_WHITE\_2\_1 | WHITE\_PT | HECKER | 21 |
| 2024 | 3 | XFOW58 | LARDVN\_LASCRU1\_1 | LARDVNTH | LASCRUCE | 21 |
| 2024 | 3 | BASE CASE | VALEXP | n/a | n/a | 19 |
| 2024 | 3 | MFOWLOB5 | LARDVN\_LASCRU1\_1 | LARDVNTH | LASCRUCE | 18 |
| 2024 | 3 | DCONLNG5 | 6046\_\_A | MGSES | FLCNS | 18 |
| 2024 | 3 | BASE CASE | WESTEX | n/a | n/a | 18 |
| 2024 | 3 | SFORYEL8 | HEXT\_YELWJC1\_1 | HEXT | YELWJCKT | 17 |
| 2024 | 3 | SBAKCED5 | 6056\_\_A | LNGSW | CONSW | 17 |
| 2024 | 3 | SFORYEL8 | HEXT\_YELWJC1\_1 | YELWJCKT | HEXT | 17 |
| 2024 | 3 | SFORYEL8 | HEXT\_MASONS1\_1 | MASONSW | HEXT | 16 |
| 2024 | 3 | DDILCOT8 | DILLEYSW\_69A1 | DILLEYSW | DILLEYSW | 16 |
| 2024 | 3 | SFORYEL8 | HEXT\_MASONS1\_1 | HEXT | MASONSW | 16 |
| 2024 | 3 | MHARNED5 | HAINE\_\_LA\_PAL1\_1 | LA\_PALMA | HAINE\_DR | 15 |
| 2024 | 3 | SBAKCED5 | HARGRO\_TWINBU1\_1 | TWINBU | HARGROVE | 15 |
| 2024 | 3 | DBIGKEN5 | HAMILT\_MAXWEL1\_1 | MAXWELL | HAMILTON | 15 |
| 2024 | 3 | MHARNED5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 15 |
| 2024 | 3 | DBIGSCH5 | BAKRFLD\_CEDCAN\_1 | CEDACA | BAKESW | 14 |
| 2024 | 3 | DBERWE58 | 415T415\_1 | MILLER | HENLY | 13 |
| 2024 | 3 | SBRAPIN8 | HAMILT\_MAVERI1\_1 | MAVERICK | HAMILTON | 12 |
| 2024 | 3 | DCONLNG5 | 6095\_\_D | LMESA | JPPOI | 12 |
| 2024 | 3 | SBRAPIN8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 12 |
| 2024 | 3 | SBONNED5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 12 |
| 2024 | 3 | SFORYEL8 | MASNPH\_MASN1\_1 | MASN | MASNPHT | 11 |
| 2024 | 3 | BASE CASE | EASTEX | n/a | n/a | 11 |
| 2024 | 3 | DSALKLN5 | 630\_\_B | KLNSW | HHSTH | 11 |
| 2024 | 3 | SBRAUVA8 | BRACKE\_ESCOND1\_1 | BRACKETT | ESCONDID | 11 |
| 2024 | 3 | DSWECCR5 | 6036\_\_A | TKWSW | MGSES | 11 |
| 2024 | 3 | SSHKCRI8 | 940\_\_A | ENWSW | TMPTN | 11 |
| 2024 | 3 | SBWDDBM5 | LPLNW\_LPLMD\_1 | LPLNW | LPLMD | 11 |
| 2024 | 3 | SN\_SLON5 | N\_SHARPE\_XF1 | N\_SHARPE | N\_SHARPE | 11 |
| 2024 | 3 | SCARFRI8 | ATSO\_SONR1\_1 | SONR | ATSO | 10 |
| 2024 | 3 | DWLFMOS5 | 6520\_\_E | ODEHV | YARBR | 10 |
| 2024 | 3 | BASE CASE | E\_PATA | n/a | n/a | 10 |
| 2024 | 3 | BASE CASE | KINNEY | n/a | n/a | 10 |
| 2024 | 3 | DCONLNG5 | 14040\_\_A | PCTSW | DEWTP | 10 |
| 2024 | 3 | DNOECED5 | HARGRO\_TWINBU1\_1 | TWINBU | HARGROVE | 10 |
| 2024 | 3 | DFOWSMG5 | LARDVN\_LASCRU1\_1 | LARDVNTH | LASCRUCE | 10 |
| 2024 | 3 | DBIGKEN5 | TREADW\_YELWJC1\_1 | TREADWEL | YELWJCKT | 9 |
| 2024 | 3 | DSALHUT5 | 270\_\_A | KNBSW | TMPSW | 9 |
| 2024 | 3 | DCONLNG5 | 15060\_\_B | VEALMOOR | KOCHTAP | 9 |
| 2024 | 3 | DCONLNG5 | BAKRFLD\_CEDCAN\_1 | CEDACA | BAKESW | 9 |
| 2024 | 3 | BASE CASE | NELRIO | n/a | n/a | 9 |
| 2024 | 3 | DLWSRNK5 | 587\_\_A | ARGYL | LWSVH | 8 |
| 2024 | 3 | DBIGKEN5 | CARVER\_TINSLE1\_1 | CARVER | TINSLEY | 8 |
| 2024 | 3 | DCAGCI58 | 415T415\_1 | MILLER | HENLY | 8 |
| 2024 | 3 | MRESMCM8 | RINCON\_WHITE\_2\_1 | WHITE\_PT | RINCON | 8 |
| 2024 | 3 | SN\_SAJO5 | LASPUL\_RAYMND1\_1 | LASPULGA | RAYMND2 | 8 |
| 2024 | 3 | XFTS89 | ALPINE\_BRONCO1\_1 | ALPINE | BRONCO | 8 |
| 2024 | 3 | XFTS89 | ALPINE\_BRONCO1\_1 | BRONCO | ALPINE | 8 |
| 2024 | 3 | SBRAPIN8 | ESCOND\_GANSO1\_1 | GANSO | ESCONDID | 7 |
| 2024 | 3 | SBRAPIN8 | ESCOND\_GANSO1\_1 | ESCONDID | GANSO | 7 |
| 2024 | 3 | MNEDPOM5 | FREER\_LOBO1\_1 | LOBO | FREER | 7 |
| 2024 | 3 | SMADSAP8 | MADDUX\_SAPOWE2\_1 | MADDUX | SAPOWER | 7 |
| 2024 | 3 | DBIGKEN5 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 7 |
| 2024 | 3 | DBERBO58 | 415T415\_1 | MILLER | HENLY | 7 |
| 2024 | 3 | DNOESGT5 | HARGRO\_TWINBU1\_1 | TWINBU | HARGROVE | 7 |
| 2024 | 3 | DFERHOR8 | 415T415\_1 | MILLER | HENLY | 7 |
| 2024 | 3 | BASE CASE | N\_TO\_H | n/a | n/a | 7 |
| 2024 | 3 | DBIGKEN5 | FORTMA\_YELWJC1\_1 | FORTMA | YELWJCKT | 6 |
| 2024 | 3 | SBRAPIN8 | GANSO\_MAVERI1\_1 | MAVERICK | GANSO | 6 |
| 2024 | 3 | SWIRJOH8 | 55T207\_1 | GILLES | WOLFCR | 6 |
| 2024 | 3 | XFOW58 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 6 |
| 2024 | 3 | DELMSAN5 | OAKS9\_69\_1 | OAKS9 | OAKS9 | 6 |
| 2024 | 3 | DFOWSMG5 | CATARI\_PILONC1\_1 | PILONCIL | CATARINA | 6 |
| 2024 | 3 | DZORHAY5 | 415T415\_1 | MILLER | HENLY | 6 |
| 2024 | 3 | DCAGCO58 | 656T656\_1 | KENDAL | BERGHE | 6 |
| 2024 | 3 | DCAGCO58 | 415T415\_1 | MILLER | HENLY | 6 |
| 2024 | 3 | SCRMSAR8 | CONCHO\_VRBS1\_1 | CONCHO | VRBS | 6 |
| 2024 | 3 | SMCEABS8 | MKLT\_TRNT1\_1 | TRNT | MKLT | 6 |
| 2024 | 3 | SBENS\_M8 | BENTS\_FRTER\_1C\_1 | S\_MISSIN | RAILROAD | 6 |
| 2024 | 3 | XFOW58 | CATARI\_PILONC1\_1 | PILONCIL | CATARINA | 6 |
| 2024 | 3 | DBIGKEN5 | FORTMA\_YELWJC1\_1 | YELWJCKT | FORTMA | 6 |
| 2024 | 3 | SBRAPIN8 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 6 |
| 2024 | 3 | SMOUJOH8 | 55T207\_1 | GILLES | WOLFCR | 6 |
| 2024 | 3 | SW\_GODE5 | 15060\_\_B | VEALMOOR | KOCHTAP | 5 |
| 2024 | 3 | DCAGCI58 | 255T279\_1 | PIPECR | MEDILA | 5 |
| 2024 | 3 | SHAYZO25 | 6T227\_1 | HAYSEN | ZORN | 5 |
| 2024 | 3 | DKG\_NB\_5 | BCVPSA03\_A | PSA | BCV | 5 |
| 2024 | 3 | SKLELOY8 | LOYOLA\_69\_1 | LOYOLA | LOYOLA | 5 |
| 2024 | 3 | BASE CASE | I\_KALO | n/a | n/a | 5 |
| 2024 | 3 | MFOWLOB5 | LASCRU\_MILO1\_1 | LASCRUCE | MILO | 5 |
| 2024 | 3 | SBRAHAM8 | GANSO\_MAVERI1\_1 | MAVERICK | GANSO | 5 |
| 2024 | 3 | DCAGCO58 | 583T583\_1 | BANDER | MASOCR | 5 |
| 2024 | 3 | BASE CASE | E\_PASP | n/a | n/a | 5 |
| 2024 | 3 | SBRAHAM8 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 5 |
| 2024 | 3 | DFOWSMG5 | LASCRU\_MILO1\_1 | LASCRUCE | MILO | 5 |
| 2024 | 3 | SMCEESK8 | MKLT\_TRNT1\_1 | TRNT | MKLT | 5 |
| 2024 | 3 | SCOLBAL8 | BALLIN\_HUMBLT1\_1 | BALLINGE | HUMBLTAP | 4 |
| 2024 | 3 | DBIGKEN5 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 4 |
| 2024 | 3 | SBRAHAM8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 4 |
| 2024 | 3 | SBWDDBM5 | LPLMK\_LPLNE\_1 | LPLMK | LPLNE | 4 |
| 2024 | 3 | MPEAMOO8 | PEARSALL\_69\_4 | PEARSALL | PEARSALL | 4 |
| 2024 | 3 | BASE CASE | T-315\_1 | JADE\_SLR | MHOS | 4 |
| 2024 | 3 | DBERBE58 | 415T415\_1 | MILLER | HENLY | 4 |
| 2024 | 3 | SCONMGS5 | 6056\_\_A | LNGSW | CONSW | 4 |
| 2024 | 3 | DFOWSMG5 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 4 |
| 2024 | 3 | DBIGKEN5 | CAMPWO\_NEWBAR1\_1 | CAMPWOOD | NEWBARKS | 4 |
| 2024 | 3 | SBRAHAM8 | HAMILT\_MAVERI1\_1 | MAVERICK | HAMILTON | 4 |
| 2024 | 3 | XFOW58 | LASCRU\_MILO1\_1 | LASCRUCE | MILO | 4 |
| 2024 | 3 | DBIGSCH5 | PALOUS\_WOLFCA1\_1 | PALOUSE | WOLFCAMP | 4 |
| 2024 | 3 | DBERES58 | 415T415\_1 | MILLER | HENLY | 4 |
| 2024 | 3 | DCAGCI58 | 656T656\_1 | KENDAL | BERGHE | 4 |
| 2024 | 3 | SBWDDBM5 | LPLNW\_LPLYH\_1 | LPLYH | LPLNW | 4 |
| 2024 | 3 | SBTPBNT8 | MYRA\_VAL\_1 | MYRA | VALYVIEW | 4 |
| 2024 | 3 | DKENCA58 | 656T656\_1 | KENDAL | BERGHE | 4 |
| 2024 | 3 | SBAKCED5 | CEDRHI\_SILT1\_1 | CEDRHILL | SILT | 4 |
| 2024 | 3 | DFRIILL8 | HAMILT\_MAXWEL1\_1 | MAXWELL | HAMILTON | 4 |
| 2024 | 3 | DFOWSMG5 | ASHERT\_CATARI1\_1 | CATARINA | ASHERTON | 4 |
| 2024 | 3 | MNEDPOM5 | BURNS\_RIOHONDO\_1 | MV\_BURNS | RIOHONDO | 4 |
| 2024 | 3 | SBAKCED5 | SAMATH\_SANW1\_1 | SANW | SAMATHIS | 4 |
| 2024 | 3 | DBBSJEW5 | 1240\_\_E | FFD | FRFWS | 4 |
| 2024 | 3 | DBEFAI58 | 415T415\_1 | MILLER | HENLY | 4 |
| 2024 | 3 | MNEDPOM5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 4 |
| 2024 | 3 | SMV\_PAR8 | RIOHND\_ERIOHND\_1 | MV\_RIOHO | RIOHONDO | 4 |
| 2024 | 3 | SMV\_PAR8 | RIOHND\_ERIOHND\_1 | RIOHONDO | MV\_RIOHO | 4 |
| 2024 | 3 | DELMSAN5 | COLETO\_VICTOR2\_1 | COLETO | VICTORIA | 4 |
| 2024 | 3 | XSA2R58 | CONCHO\_VRBS1\_1 | CONCHO | VRBS | 4 |
| 2024 | 3 | SNEDSTE5 | BURNS\_RIOHONDO\_1 | RIOHONDO | MV\_BURNS | 4 |
| 2024 | 3 | DSWETKW5 | 6036\_\_A | TKWSW | MGSES | 3 |
| 2024 | 3 | STANPAW5 | I\_KALO | n/a | n/a | 3 |
| 2024 | 3 | DDILCOT8 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 3 |
| 2024 | 3 | DELMSAN5 | BEEVIL\_NORMAN1\_1 | BEEVILLE | NORMANNA | 3 |
| 2024 | 3 | DBOGPIR8 | BT\_MLR88\_A | BT | MLR | 3 |
| 2024 | 3 | DSTPHLJ5 | CKT\_3124\_1 | STP | HLJ | 3 |
| 2024 | 3 | DBLHJWF5 | JCKSTP18\_A | STP | JCK | 3 |
| 2024 | 3 | DWPWFWP5 | MSNPET04\_A | PET | MSN | 3 |
| 2024 | 3 | DKENCA58 | 255T279\_1 | PIPECR | MEDILA | 3 |
| 2024 | 3 | DBIGKEN5 | ESCOND\_GANSO1\_1 | GANSO | ESCONDID | 3 |
| 2024 | 3 | BASE CASE | HAMILT\_MAXWEL1\_1 | MAXWELL | HAMILTON | 3 |
| 2024 | 3 | SCT2CAR8 | HAMILT\_MAXWEL1\_1 | MAXWELL | HAMILTON | 3 |
| 2024 | 3 | XFOW58 | ASHERT\_CATARI1\_1 | CATARINA | ASHERTON | 3 |
| 2024 | 3 | SILLFTL8 | CARVER\_TINSLE1\_1 | CARVER | TINSLEY | 3 |
| 2024 | 3 | DCALBEC8 | U2\_X3\_1 | BRAUNIG | X3 | 3 |
| 2024 | 3 | SSTAWIC8 | 138\_IH2\_COT\_1 | IH20 | TNCOLIET | 3 |
| 2024 | 3 | SCOCBAR9 | ALPINE\_BRONCO1\_1 | ALPINE | BRONCO | 3 |
| 2024 | 3 | SCOCBAR9 | ALPINE\_BRONCO1\_1 | BRONCO | ALPINE | 3 |
| 2024 | 3 | DBIGKEN5 | ESCOND\_GANSO1\_1 | ESCONDID | GANSO | 3 |
| 2024 | 3 | SRAYRI38 | RAY\_MV\_R\_1 | MV\_RAYTP | RAYMND2 | 3 |
| 2024 | 3 | SRAYRI38 | RAY\_MV\_R\_1 | RAYMND2 | MV\_RAYTP | 3 |
| 2024 | 3 | MFOWLOB5 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 3 |
| 2024 | 3 | DBBSRCH5 | 1240\_\_E | FFD | FRFWS | 3 |
| 2024 | 3 | DSGTSCH5 | HARGRO\_TWINBU1\_1 | TWINBU | HARGROVE | 3 |
| 2024 | 3 | SDBMFID5 | LPLWA\_LPLDB\_1 | LPLDB | LPLWA | 3 |
| 2024 | 3 | SOBWAP5 | OB\_WAP98\_A | WAP | OB | 3 |
| 2024 | 3 | SHLJSTP5 | CKT\_3124\_1 | STP | HLJ | 3 |
| 2024 | 3 | SBAKCED5 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 3 |
| 2024 | 3 | DBLBYWF5 | JCKSTP18\_A | STP | JCK | 3 |
| 2024 | 3 | SSTILOM8 | LA\_PAL\_VCAVAZ1\_1 | LA\_PALMA | VCAVAZOS | 3 |
| 2024 | 3 | DSCOTKW5 | 6215\_\_A | BCKSW | CGRSW | 3 |
| 2024 | 3 | MFOWLOB5 | ASHERT\_CATARI1\_1 | CATARINA | ASHERTON | 3 |
| 2024 | 3 | XFOW58 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 3 |
| 2024 | 3 | MHARNED5 | BURNS\_HEIDLBRG\_1 | MV\_BURNS | MV\_HBRG4 | 3 |
| 2024 | 3 | SVEAW\_L5 | 6217\_\_A | WLVSW | GAILS | 3 |
| 2024 | 3 | SWORBRD8 | 138\_WIC\_STG\_1 | WICKETT | STAGHORN | 2 |
| 2024 | 3 | DSCOTKW5 | 15060\_\_B | VEALMOOR | KOCHTAP | 2 |
| 2024 | 3 | SSAMTH35 | 506\_\_A | SAMSW | FBRSW | 2 |
| 2024 | 3 | SWIRJOH8 | 56T379\_1 | GILLES | FREDER | 2 |
| 2024 | 3 | BASE CASE | I\_PASP | n/a | n/a | 2 |
| 2024 | 3 | MNEDPOM5 | LARDVN\_LASCRU1\_1 | LARDVNTH | LASCRUCE | 2 |
| 2024 | 3 | DELMSAN5 | POT\_PLSN\_1 | POTEETS | PLSNTOS | 2 |
| 2024 | 3 | DSCOTKW5 | 15060\_\_A | KOCHTAP | BUZSW | 2 |
| 2024 | 3 | DWLDSCO5 | 15060\_\_B | VEALMOOR | KOCHTAP | 2 |
| 2024 | 3 | DCAGCO58 | 450T450\_1 | HENLY | DRIPSP | 2 |
| 2024 | 3 | DFERHOR8 | 450T450\_1 | HENLY | DRIPSP | 2 |
| 2024 | 3 | SCARFRI8 | ATSO\_OZNC1\_1 | ATSO | OZNC | 2 |
| 2024 | 3 | DELMSAN5 | BLESSI\_LOLITA1\_1 | BLESSING | LOLITA | 2 |
| 2024 | 3 | DNOECED5 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 2 |
| 2024 | 3 | DNOESGT5 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 2 |
| 2024 | 3 | DCAGTA58 | H3\_K0\_1 | K0 | H3 | 2 |
| 2024 | 3 | SBOSWHT8 | LKW\_WHT\_1 | LKWHITNY | WHTNY | 2 |
| 2024 | 3 | DBIGKEN5 | MADDUX\_TREADW1\_1 | MADDUX | TREADWEL | 2 |
| 2024 | 3 | DELMSAN5 | UVALDE\_W\_BATE1\_1 | UVALDE | W\_BATESV | 2 |
| 2024 | 3 | SW\_GODE5 | 15060\_\_A | KOCHTAP | BUZSW | 2 |
| 2024 | 3 | DBIGKEN5 | MADDUX\_TREADW1\_1 | TREADWEL | MADDUX | 2 |
| 2024 | 3 | SBRIJAC8 | MYRA\_VAL\_1 | MYRA | VALYVIEW | 2 |
| 2024 | 3 | MSCASTI8 | RIOHND\_ERIOHND\_1 | MV\_RIOHO | RIOHONDO | 2 |
| 2024 | 3 | SMV\_MV78 | RIOHND\_ERIOHND\_1 | MV\_RIOHO | RIOHONDO | 2 |
| 2024 | 3 | SSTISCA8 | RIOHND\_ERIOHND\_1 | MV\_RIOHO | RIOHONDO | 2 |
| 2024 | 3 | SMV\_RI28 | SCARBI\_STILLM1\_1 | SCARBIDE | STILLMAN | 2 |
| 2024 | 3 | XDAN89 | TAB\_DANS\_1 | DANSBY | TABOR | 2 |
| 2024 | 3 | XFOW58 | BRUNI\_69\_1 | BRUNI | BRUNI | 2 |
| 2024 | 3 | SN\_SAJO5 | CELANE\_KLEBER1\_1 | KLEBERG | CELANEBI | 2 |
| 2024 | 3 | XBAL89 | CONCHO\_VRBS1\_1 | CONCHO | VRBS | 2 |
| 2024 | 3 | XBLE58 | SAR\_FRAN\_1 | FRANKC | SARGNTS | 2 |
| 2024 | 3 | SBROALP9 | COCS\_FTST1\_1 | COCS | FTST | 2 |
| 2024 | 3 | DBERBE58 | 450T450\_1 | HENLY | DRIPSP | 2 |
| 2024 | 3 | SKOCBUZ8 | 6217\_\_A | WLVSW | GAILS | 2 |
| 2024 | 3 | SSHKCRI8 | 940\_\_B | TMPTN | WXHCH | 2 |
| 2024 | 3 | SN\_SAJO5 | CELANE\_N\_SHAR1\_1 | CELANEBI | N\_SHARPE | 2 |
| 2024 | 3 | SCOMHA38 | MAXWEL\_WHITIN1\_1 | MAXWELL | WHITING | 2 |
| 2024 | 3 | DSGTSCH5 | SAMATH\_SANW1\_1 | SANW | SAMATHIS | 2 |
| 2024 | 3 | DBIGKEN5 | BONDRO\_SONR1\_1 | SONR | BONDROAD | 2 |
| 2024 | 3 | MFOWLOB5 | CATARI\_PILONC1\_1 | PILONCIL | CATARINA | 2 |
| 2024 | 3 | SWHILON5 | COLETO\_VICTOR2\_1 | COLETO | VICTORIA | 2 |
| 2024 | 3 | SMOUJOH8 | 57T207\_1 | WOLFCR | KERRST | 2 |
| 2024 | 3 | DCONLNG5 | 6045\_\_A | FLCNS | MDLNE | 2 |
| 2024 | 3 | SBROALP9 | COCS\_FTST1\_1 | FTST | COCS | 2 |
| 2024 | 3 | SBRAHAM8 | ESCOND\_GANSO1\_1 | ESCONDID | GANSO | 2 |
| 2024 | 3 | DCONLNG5 | RKYROAD\_STILES\_1 | RCKYROAD | STILES | 2 |
| 2024 | 3 | SN\_SAJO5 | N\_SHARPE\_PS3 | N\_SHARPE | N\_SHARPE | 1 |
| 2024 | 3 | BASE CASE | RIOHND\_ERIOHND\_1 | MV\_RIOHO | RIOHONDO | 1 |
| 2024 | 3 | DBLHJWF5 | STPWAP39\_1 | STP | WAP | 1 |
| 2024 | 3 | DBECKIR8 | U2\_X3\_1 | BRAUNIG | X3 | 1 |
| 2024 | 3 | DTRSENT5 | 1255\_\_B | SCSES | STCKY | 1 |
| 2024 | 3 | SW\_GW\_L5 | 15060\_\_B | VEALMOOR | KOCHTAP | 1 |
| 2024 | 3 | SHAYZOR5 | 388T388\_1 | HAYSEN | ZORN | 1 |
| 2024 | 3 | XBSP89 | 6685\_\_A | CGRSW | CLCTY | 1 |
| 2024 | 3 | DBBSRCH5 | 940\_\_A | ENWSW | TMPTN | 1 |
| 2024 | 3 | XYEL88 | BALLIN\_PAINTR1\_1 | BALLINGE | PAINTROC | 1 |
| 2024 | 3 | SBRAHAM8 | BRACKE\_ESCOND1\_1 | BRACKETT | ESCONDID | 1 |
| 2024 | 3 | SVICCO28 | CALLIC\_LON\_HI1\_1 | LON\_HILL | CALLICOA | 1 |
| 2024 | 3 | DWPWFWP5 | DOWOAS18\_A | DOW | OAS | 1 |
| 2024 | 3 | DTULTES5 | FARMLAND\_LONGD\_1 | FARMLAND | W\_LD\_345 | 1 |
| 2024 | 3 | MHARNED5 | HAINE\_\_OLEAND1\_1 | HAINE\_DR | OLEANDER | 1 |
| 2024 | 3 | DCALBEC8 | N4\_X3\_1 | X3 | CALAVERS | 1 |
| 2024 | 3 | DBIGSCH5 | SANTAR\_WOLFCA1\_1 | WOLFCAMP | SANTARIT | 1 |
| 2024 | 3 | SNWEWES8 | WES\_MV\_W\_1 | WESLACO | MV\_WESL4 | 1 |
| 2024 | 3 | SSTAWIC8 | 138\_COT\_BPT\_1 | TNCOLIET | BRDSPRYT | 1 |
| 2024 | 3 | SSTAPYO8 | 138\_IH2\_COT\_1 | IH20 | TNCOLIET | 1 |
| 2024 | 3 | DBEFAI58 | 450T450\_1 | HENLY | DRIPSP | 1 |
| 2024 | 3 | SSAMTH35 | 505\_\_B | FBRSW | THSES | 1 |
| 2024 | 3 | SECRDMT8 | 6235\_\_A | CGRSW | SNYDR | 1 |
| 2024 | 3 | DCAGCI58 | BERGHE\_AT1H | BERGHE | BERGHE | 1 |
| 2024 | 3 | DCAGCO58 | BERGHE\_AT1H | BERGHE | BERGHE | 1 |
| 2024 | 3 | DZORHAY5 | BERGHE\_AT1H | BERGHE | BERGHE | 1 |
| 2024 | 3 | DDILCOT8 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2024 | 3 | SSOLALM8 | COCS\_FTST1\_1 | COCS | FTST | 1 |
| 2024 | 3 | SBAKCED5 | ESCOND\_GANSO1\_1 | ESCONDID | GANSO | 1 |
| 2024 | 3 | DWAP\_OB5 | MSNPET04\_A | PET | MSN | 1 |
| 2024 | 3 | DWPWFCK5 | MSNPET04\_A | PET | MSN | 1 |
| 2024 | 3 | SOBWA2P5 | OB\_WAP99\_A | WAP | OB | 1 |
| 2024 | 3 | SCAGKEN5 | 115T123\_1 | KENDAL | KERRST | 1 |
| 2024 | 3 | DSLKSOL5 | 138\_FLT\_FXT\_1 | TNFXTAIL | FLAT\_TOP | 1 |
| 2024 | 3 | DBUCRGP5 | 500\_\_A | SAMSW | THSES | 1 |
| 2024 | 3 | DKLNRGP5 | 500\_\_A | SAMSW | THSES | 1 |
| 2024 | 3 | DSCOTKW5 | 6095\_\_D | LMESA | JPPOI | 1 |
| 2024 | 3 | XALM589 | ALMC\_69T1 | ALMC | ALMC | 1 |
| 2024 | 3 | MASHDIL8 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 1 |
| 2024 | 3 | SBIGTWI5 | BAKRFLD\_CEDCAN\_1 | CEDACA | BAKESW | 1 |
| 2024 | 3 | MASHDIL8 | CARIZOSPG\_BEVO\_1 | BEVO | CARIZOS | 1 |
| 2024 | 3 | DELMSAN5 | CATARI\_PILONC1\_1 | CATARINA | PILONCIL | 1 |
| 2024 | 3 | DNOECED5 | CEDRHI\_SILT1\_1 | CEDRHILL | SILT | 1 |
| 2024 | 3 | MWHPLON5 | COLETO\_VICTOR1\_1 | COLETO | VICTORIA | 1 |
| 2024 | 3 | DBERBO58 | H3\_K0\_1 | K0 | H3 | 1 |
| 2024 | 3 | DBERWE58 | H3\_K0\_1 | K0 | H3 | 1 |
| 2024 | 3 | DLWSRNK5 | LOCUST\_NODE\_1 | LOCUST\_D | DMENODE | 1 |
| 2024 | 3 | DUVASA89 | 2585\_1 | DOWNIES | MOORE | 1 |
| 2024 | 3 | DVENFTS5 | 500\_\_A | SAMSW | THSES | 1 |
| 2024 | 3 | DLEGOUT5 | 50\_\_A | BBSES | JEWET | 1 |
| 2024 | 3 | DMTSCOS5 | 6240\_\_C | SACRC | DPCRK | 1 |
| 2024 | 3 | DMTSCOS5 | 6437\_\_F | SCRCV | KNAPP | 1 |
| 2024 | 3 | SCMNCPS5 | 651\_\_B | CMNSW | CMNTP | 1 |
| 2024 | 3 | SCAGKEN5 | 656T656\_1 | KENDAL | BERGHE | 1 |
| 2024 | 3 | XFTS89 | ALMC\_69T1 | ALMC | ALMC | 1 |
| 2024 | 3 | DFRIILL8 | CARVER\_TINSLE1\_1 | CARVER | TINSLEY | 1 |
| 2024 | 3 | UZIEPV11 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 1 |
| 2024 | 3 | SILLFTL8 | MAXWEL\_WHITIN1\_1 | MAXWELL | WHITING | 1 |
| 2024 | 3 | MFOWLOB5 | MINES\_\_NLARSW1\_1 | MINES\_RD | NLARSW | 1 |
| 2024 | 3 | DMCEBUT8 | MKLT\_TRNT1\_1 | TRNT | MKLT | 1 |
| 2024 | 3 | DPHRCTR5 | MSNPET04\_A | PET | MSN | 1 |
| 2024 | 3 | DSTEDES8 | STERT\_FMR1 | STERT | STERT | 1 |
| 2024 | 3 | DMGSCON5 | 14030\_\_B | MGSES | MSRPD | 1 |
| 2024 | 3 | DWLFMOS5 | 6485\_\_B | RLKSW | PWPOD | 1 |
| 2024 | 3 | XBOM58 | 6558\_\_B | FSHSW | WFALS | 1 |
| 2024 | 3 | MPRSPA25 | 871\_\_A | COMRC | COMSW | 1 |
| 2024 | 3 | DMTFCRS8 | 940\_\_A | ENWSW | TMPTN | 1 |
| 2024 | 3 | SODLBRA8 | MAXWEL\_WHITIN1\_1 | MAXWELL | WHITING | 1 |
| 2024 | 3 | BASE CASE | N\_SHARPE\_PS3 | N\_SHARPE | N\_SHARPE | 1 |
| 2024 | 3 | DNOECED5 | SAMATH\_SANW1\_1 | SANW | SAMATHIS | 1 |
| 2024 | 3 | MNEDPOM5 | WES\_MV\_W\_1 | WESLACO | MV\_WESL4 | 1 |
| 2024 | 3 | DTRCFOR5 | 1920\_\_B | ATHNS | TRNDD | 1 |
| 2024 | 3 | DCAGCI58 | 460T460\_1 | MEDILA | W1 | 1 |
| 2024 | 3 | SLCSTH25 | 506\_\_A | SAMSW | FBRSW | 1 |
| 2024 | 3 | SSUNMGS8 | 6240\_\_C | SACRC | DPCRK | 1 |
| 2024 | 3 | DCAGTA58 | 656T656\_1 | KENDAL | BERGHE | 1 |
| 2024 | 3 | XALM689 | ALMC\_T2 | ALMC | ALMC | 1 |
| 2024 | 3 | MSTPANG5 | COLETO\_VICTOR1\_1 | COLETO | VICTORIA | 1 |
| 2024 | 3 | DBERBE58 | H3\_K0\_1 | K0 | H3 | 1 |
| 2024 | 3 | DBLBYWF5 | STPWAP39\_1 | STP | WAP | 1 |
| 2024 | 3 | DDEESTR8 | V2\_Z5\_1 | Z5 | V2 | 1 |
| 2024 | 3 | DBWNRGP5 | 500\_\_A | SAMSW | THSES | 1 |
| 2024 | 3 | SMOUJOH8 | 56T379\_1 | GILLES | FREDER | 1 |
| 2024 | 3 | SWIRJOH8 | 57T207\_1 | WOLFCR | KERRST | 1 |
| 2024 | 3 | SW\_GODE5 | 6056\_\_A | LNGSW | CONSW | 1 |
| 2024 | 3 | DDMTBCK8 | 6235\_\_A | CGRSW | SNYDR | 1 |
| 2024 | 3 | SMGPBRN8 | 670\_\_A | BRNWD | BRNSO | 1 |
| 2024 | 3 | SREVDIL8 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 1 |
| 2024 | 3 | DFOWSMG5 | BRUNI\_69\_1 | BRUNI | BRUNI | 1 |
| 2024 | 3 | SNWEWES8 | BURNS\_RIOHONDO\_1 | MV\_BURNS | RIOHONDO | 1 |
| 2024 | 3 | STREMAD8 | CRMW1T\_EDEN1\_1 | EDEN | CRMW1TP | 1 |
| 2024 | 3 | DNOECED5 | ESCOND\_GANSO1\_1 | ESCONDID | GANSO | 1 |
| 2024 | 3 | MCE\_LO58 | FREER\_LOBO1\_1 | LOBO | FREER | 1 |
| 2024 | 3 | SSPUASP8 | GIRA\_T\_SPUR1\_1 | SPUR | GIRA\_TAP | 1 |
| 2024 | 3 | SCOLBAL8 | HUMBLT\_NOVICT1\_1 | HUMBLTAP | NOVICTAP | 1 |
| 2024 | 3 | XLO2N58 | LON\_HI\_SERDEV2\_1 | LON\_HILL | LON\_HILL | 1 |
| 2024 | 3 | SHA2MAX8 | MAXWEL\_WHITIN1\_1 | MAXWELL | WHITING | 1 |
| 2024 | 3 | BASE CASE | RAMBLER\_GENTIE\_1 | RAMBLER | TWINBU | 1 |
| 2024 | 3 | DBRNSTR8 | V2\_Z5\_1 | Z5 | V2 | 1 |
| 2024 | 3 | DZORHAY5 | 450T450\_1 | HENLY | DRIPSP | 1 |
| 2024 | 3 | SGDNTEL5 | ACSSW\_AX1H | ACSSW | ACSSW | 1 |
| 2024 | 3 | DELMSAN5 | ASHERT\_CATARI1\_1 | ASHERTON | CATARINA | 1 |
| 2024 | 3 | SCOMHA38 | CARVER\_TINSLE1\_1 | CARVER | TINSLEY | 1 |
| 2024 | 3 | SSOLALM8 | COCS\_FTST1\_1 | FTST | COCS | 1 |
| 2024 | 3 | MWHPLON5 | COLETO\_VICTOR2\_1 | COLETO | VICTORIA | 1 |
| 2024 | 3 | DCONLNG5 | CRTVLE\_EINSTEN\_1 | EINSTEIN | CRTRVLLE | 1 |
| 2024 | 3 | DNOESGT5 | ESCOND\_GANSO1\_1 | ESCONDID | GANSO | 1 |
| 2024 | 3 | DCOTEDI5 | FARMLAND\_LONGD\_1 | FARMLAND | W\_LD\_345 | 1 |
| 2024 | 3 | DELMSAN5 | GANSO\_MAVERI1\_1 | GANSO | MAVERICK | 1 |
| 2024 | 3 | BASE CASE | MCCAMY | n/a | n/a | 1 |
| 2024 | 3 | DELMSAN5 | NORMAN\_PETTUS1\_1 | NORMANNA | PETTUS | 1 |

1. Current Wind Generation Record: 27,548 MW on 01/07/2024 at 18:42 | Current Wind Penetration Record: 69.15% on 04/10/2022 at 01:43

 Current Solar Generation Record: 18,881 MW on 03/28/2024 at 11:24 | Current Solar Penetration Record: 42.98% 03/28/2024 at 11:27 [↑](#footnote-ref-2)
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-3)
3. See DC Tie Operating Procedure (<http://www.ercot.com/mktrules/guides/procedures>) for more details. [↑](#footnote-ref-4)