

**February 2015 ERCOT Monthly Operations Report**

**Reliability and Operations Subcommittee Meeting**

**April 2, 2015**

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# Report Highlights

* The unofficial ERCOT peak for February was 54,505 MW.
* There were two frequency events in February. PMU data indicates the ERCOT system transitioned well in each case.
* There were three instances where Responsive Reserves were deployed, two of which were the result of frequency events.
* There were no RUC commitments in February.
* The level of reportable SCED congestion increased in February. This congestion was due primarily to planned outages and area load/gen patterns. There was no activity on the Generic Transmission Constraints (GTCs).
* There were no significant system events in ERCOT during the month of February.
* ERCOT Applications performed well throughout the month. There were no issues in February.

# Frequency Control

## Frequency Events

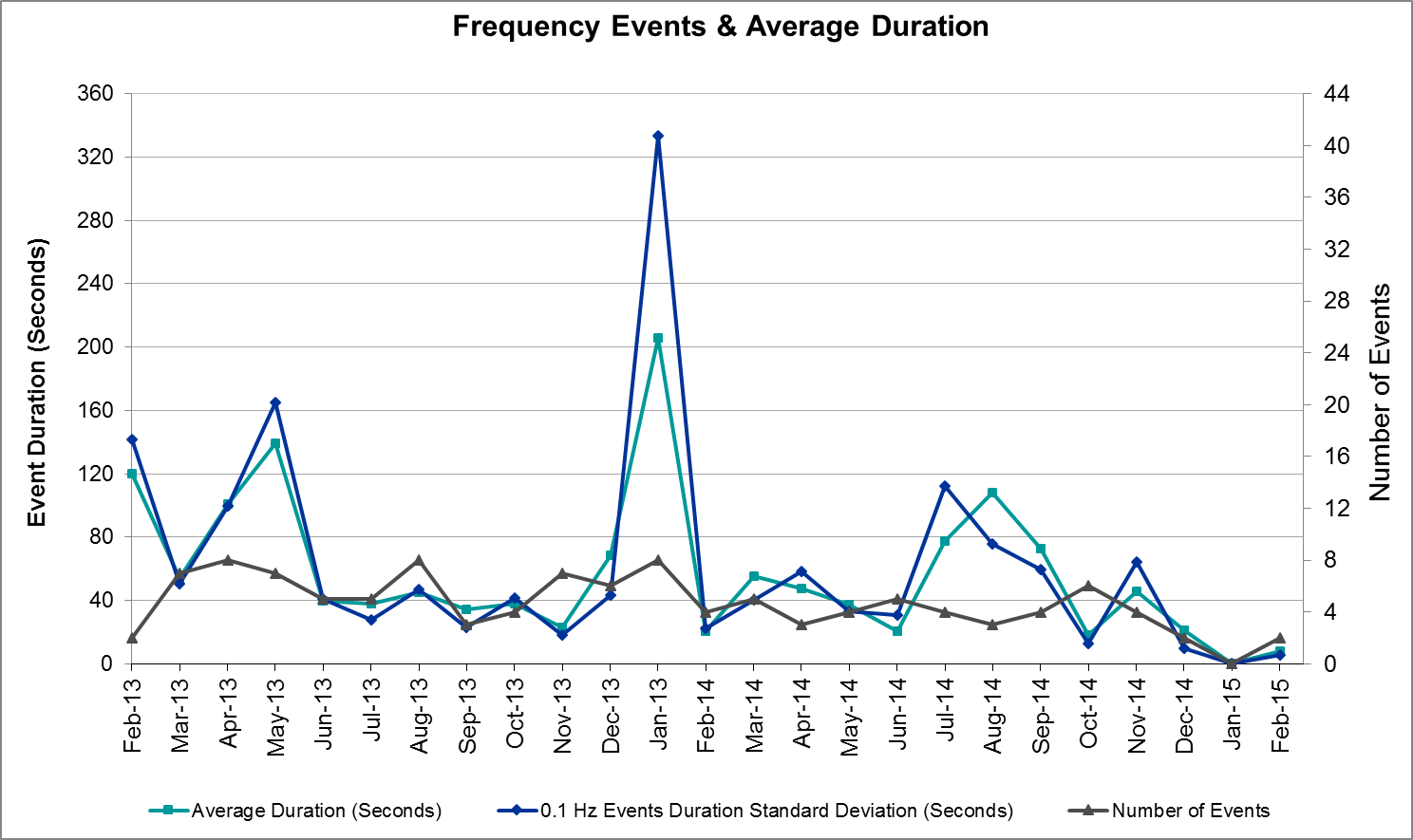
The ERCOT Interconnection experienced two frequency events in February, all of which resulted from Resource trips. The average event duration was approximately 8 seconds.

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

A summary of the frequency events is provided below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date and Time** | **Max/Min Frequency**  **(Hz)** | **Duration of Event**  **(seconds)** | **PMU Data** | | **Comments** |
| **Oscillation Mode (Hz)** | **Damping Ratio** |
| 2/1/2015 18:43:10 | 59.869 | 12 | 0.686 | 8.39% | Unit trip with approximately 579 MW |
| 2/12/2015 16:53:28 | 59.889 | 4 | 0.687 | 10.49% | Unit trip with approximately 526 MW |

(Note: the duration of the frequency events is defined to be the time at which the frequency was outside the range of 60±0.1 Hz)



## Responsive Reserve Events

There were three events where Responsive Reserve MWs were released to SCED in February. 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** |
| 2/1/2015 18:43:16 | 2/1/2015 18:45:44 | 0:02:28 | 214.15 |  |
| 2/10/2015 10:38:24 | 2/10/2015 10:40:08 | 0:01:44 | 89.35 | Two units tripped carrying 160MW and 170MW, respectively; frequency dropped to 59.904. Event does not meet criteria for PDCWG review. |
| 2/12/2015 16:53:34 | 2/12/2015 16:57:06 | 0:03:32 | 346.67 |  |

## Load Resource Events

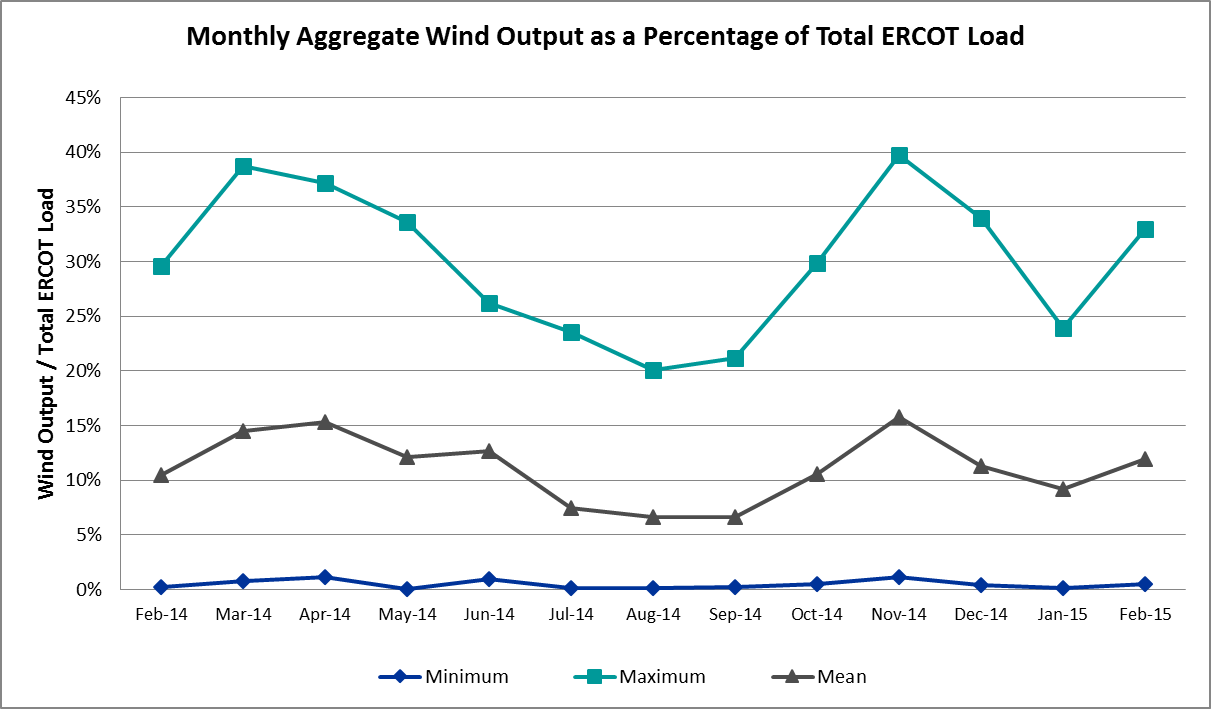
There were no load resource deployment events in February.

# Reliability Unit Commitment

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

There were no DRUC or HRUC commitments in February.

# Wind Generation as a Percent of Load



# Congestion Analysis

The number of congestion events experienced by the ERCOT system increased in February due to planned outages and area load/gen patterns. There was no activity on the Generic Transmission Constraints (GTCs) in February.

## Notable Constraints for February

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contingency** | **Overload** | **# of Days Constraint Active** | **Estimated Congestion Rent** | **Transmission Project** |
| San Angelo North 138\_69T1 138/69kV | San Angelo College Hills 138\_69T1 138/69 kV | 1 | $4,833,944 |  |
| Bates - Frontera 138 kV | Frontera - Goodwin 138 kV | 3 | $4,074,788 |  |
| DCKT Lost Pines - Austrop & Dunlop 345 kV | Fayette Plant 1 - Fayette Plant 2 345 kV | 6 | $2,760,884 |  |
| Orange Grove Switching Station - Lon Hill 138 kV | Lon Hill - Smith 69 kV | 9 | $1,792,890 | 16TPIT0026, 2012-R18 |
| Los Fresnos - Loma Alta Substation 138 kV | La Palma - Villa Cavazos 138 kV | 1 | $1,575,342 |  |
| DCKT Flewellen - Obrien and Maso Road 138 kV | Tomball - Hockley 138 kV | 9 | $1,286,964 | 3682A, 3682B |
| DCKT Hill Country - Marion and Elmcreek 345 kV | Marion - Skyline 345 kV | 6 | $1,171,008 | 4081 |
| DCKT Jewett - Singleton 345 kV | Gibbons Creek - Singleton 345 kV (SNGXGC75) | 9 | $829,987 | 2013-R63 |
| DCKT Lon Hill - North Edinburg 345 kv and Orange Grove Switching Station 138 kV | Lon Hill - Smith 69 kV | 8 | $740,561 | 16TPIT0026, 2012-R18 |
| Victoria 138\_69A2 138/69 kV | Victoria - Magruder 138 kV | 3 | $653,553 |  |
| Laquinta - Lobo 138 kV | Bruni 138\_69\_1 138/69 kV | 7 | $467,114 | 13TPIT0148 |
| Gila - Hiway 9 138 kV | Gila - Morris Street 138 kV | 4 | $154,973 |  |
| Koch Up River - Gila 138 kV | Gila - Morris Street 138 kV | 5 | $122,648 |  |
| Adamsville - Evant 138 KV | Goldthwaite 29AT2 138/69 kV | 4 | $110,676 | 4459 |
| Lobo 1\_138\_69\_Auto 138/69 kV | Bruni 138\_69\_1 138/69 kV | 3 | $70,207 | 13TPIT0148 |
| Coleto Creek - Pawnee Switching Station 345 KV | Victoria - Magruder 138 kV | 3 | $32,491 |  |
| Uvalde Aep - Odlaw Switchyard 138 kV | Hamilton Road - Maverick 138 kV | 4 | $26,242 | 06TPIT0084, 06TPIT0068, 16TPIT0024 |
| Sandow Switch - Austrop 345 kV | Sandow Switch - Austrop 345 kV | 3 | $21,596 | 4477, 2014-SC15 |
| Bosque Switch - Elm Mott 345 kV | Bosque Switch - Rogers Hill 138 kV | 4 | $15,505 | 4356, 2014-NC7 |
| DCKT Ferguson - Granite Mountain and Wirtz - Starcke - Paleface 138 kV | Wirtz - Flat Rock Lcra 138 kV | 3 | $8,544 | 4465 |
| Cottonwood Road Switch - Loftin 69 kV | Shannon - Post Oak Switch 69 kV | 4 | $8,516 | 15TPIT0011 |
| Scurry Switch - Sun Switch 138 kV | Wolfgang - Rotan 69 kV | 5 | $3,817 |  |

## Generic Transmission Constraint Congestion

There was no activity on any ERCOT GTCs in February.

## Manual Overrides for February

None

## Congestion Costs for Calendar Year 2015

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contingency** | **Binding Element** | **# of 5-min SCED Intervals** | **Estimated Congestion Rent** | **Transmission Project** |
| DCKT Hill Country - Marion and Elmcreek 345 kV | Marion - Skyline 345 kV | 939 | $6,879,055 | 4081 |
| Orange Grove Switching Station - Lon Hill 138 kV | Lon Hill - Smith 69 kV | 3156 | $4,812,785 | 16TPIT0026, 2012-R18 |
| San Angelo North 138\_69T1 138/69kV | San Angelo College Hills 138\_69T1 138/69 kV | 352 | $4,546,381 |  |
| Rio Hondo (2H) Axfmr 345/138 kV | Aderhold - Elsa 138 kV | 272 | $4,403,272 |  |
| Bates - Frontera 138 kV | Frontera - Goodwin 138 kV | 249 | $3,852,440 |  |
| DCKT Lost Pines - Austrop & Dunlop 345 kV | Fayette Plant 1 - Fayette Plant 2 345 kV | 1,203 | $2,792,905 |  |
| Basecase | Valley Import | 32 | $1,944,267 |  |
| Scurry Switch - Sun Switch 138 kV | Matador - Roaring Springs 69 kV | 182 | $1,908,900 |  |
| Los Fresnos - Loma Alta Substation 138 kV | La Palma - Villa Cavazos 138 kV | 58 | $1,415,989 |  |
| DCKT Flewellen - Obrien and Maso Road 138 kV | Tomball - Hockley 138 kV | 664 | $1,286,168 | 3682A, 3682B |
| DCKT Jewett - Singleton 345 kV | Gibbons Creek - Singleton (SNGXGC99) | 1458 | $898,604 | 2013-R63 |
| DCKT Tonkawa Switch - Scurry County South Switch 345 kV | Bluff Creek Switch - Exxon Sharon Ridge 138 kV | 162 | $895,088 |  |
| DCKT Royse Switch - Forney Switch 345 kV | Forney Switch AXFMR3L 345/138 kV | 44 | $841,394 |  |
| DCKT Jewett - Singleton 345 kV | Gibbons Creek - Singleton 345 kV (SNGXGC75) | 1057 | $831,171 | 2013-R63 |
| Jim Christal Substation - West Denton 138 kV | Bonnie Brae - North Lakes 69 kV | 56 | $792,701 |  |
| Laquinta - Lobo 138 kV | Bruni 138\_69\_1 138/69 kV | 1478 | $756,621 | 13TPIT0148 |
| Victoria 138\_69A2 138/69 kV | Victoria - Magruder 138 kV | 469 | $686,406 |  |
| Mason Aep - Fort Mason 138 kV | Coronado AT4 138/69 kV | 126 | $662,435 |  |
| Winks Sub - Permian Basin Ses 138 kV | Permian Basin - Ward Gulf Tap 138 kV | 13 | $650,475 |  |
| DCKT MT Enterprise - Trinidad SES & Martin Lake SES - Stryker Creek SES 345kV | Nacogdoches AXFMR1 345/138 kV | 23 | $555,695 |  |

# System Events

## ERCOT Peak Load

The unofficial ERCOT peak load for the month was 54,505 MW and occurred on February 23 during hour ending 20:00.

## 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 reportable events in February.

## TRE/DOE Reportable Events

None

## New/Updated Constraint Management Plans

One RAP was removed in February: Lost Creek – Cuero Hydro 69 kV Line.

Two MPs were removed in February: Kenedy Switch 138/69 kV Autotransformer and the Kenedy Switch to Helena 69 kV Line.

All three were deleted on 2/1/2015.

## New/Modified/Removed SPS

None

## New Procedures/Forms/Operating Bulletins

None

# Emergency Conditions

## OCNs

|  |  |
| --- | --- |
| **Date and Time** | **Description** |
| 2/27/2015 17:13 | An OCN has been issued due to ERCOT developing a new Generic Transmission Constraint due to a local voltage stability issue in South Texas near Ajo. Further details associated with this GTC are being posted to the MIS Secure Area at this time. |

## Advisories

|  |  |
| --- | --- |
| **Date and Time** | **Description** |
| 2/20/2015 10:00 | ERCOT issued an Advisory for the cold weather system approaching late Sunday, February 22, 2015, through Monday, February 23, 2015, with freezing rain and sleet forecasted for the North and West zones. |
| 2/28/2015 17:51 | ERCOT issued an Advisory due to the postponing of the DAM solution for Operating Day Sunday, March 1, 2015. |

## Watches

|  |  |
| --- | --- |
| **Date and Time** | **Description** |
| 2/22/2015 12:39 | ERCOT issued a Transmission Watch due to the contingency loss of Fort Mason to Gillespie 138kV line overloads Fredricksburg Phillips Tap 69kV line while a Temporary Outage Action Plan is being developed. |

## Emergency Notices

None

# Application Performance

ERCOT system applications performed well in February. There were no issues to report.

## TSAT/VSAT Performance Issues

None

## Communication Issues

None

# Net-Forecast Bias Applied to NSRS Procurement for March 2015

Each month, ERCOT calculates a net Forecast Bias pursuant to the ERCOT Ancillary Services Methodology for procurement of Non-Spinning Reserve Service (NSRS). The table below indicates the amount of net Forecast Bias that was applied to the NSRS procurement for specified blocks of time for the month of March, 2015.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Blocks** | **Negative Net Load Forecast Average Error - By Weather Zone for the 5 Largest Zones** | | | | |
| **Coast** | **East** | **North Central** | **South Central** | **Southern** |
| **1-2** | 0 | 0 | 0 | 0 | 0 |
| **3-6** | 0 | 0 | 0 | 0 | 0 |
| **7-10** | 0 | 0 | 0 | 0 | 0 |
| **11-14** | 0 | 0 | 0 | 0 | 0 |
| **15-18** | 0 | 0 | 0 | 0 | 0 |
| **19-22** | 0 | 0 | 0 | 0 | 0 |
| **23-24** | 0 | 0 | 0 | 0 | 0 |

# Appendix A: Real-Time Constraints

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contingency** | **Constrained Element** | **From Station** | **To Station** | **# of Days Constraint Active** |
| DFL\_MAR8 | HK\_TB\_66\_A | TB | HK | 9 |
| DJEWSNG5 | SNGXGC75\_1 | GIBCRK | SNG | 9 |
| SORNLON8 | LON\_HI\_SMITH1\_1 | LON\_HILL | SMITH | 9 |
| DLONOR58 | LON\_HI\_SMITH1\_1 | LON\_HILL | SMITH | 8 |
| SLAQLOB8 | BRUNI\_69\_1 | BRUNI | BRUNI | 7 |
| DAUSLOS5 | 336T405\_1 | FPPYD1 | FPPYD2 | 6 |
| DHILELM5 | MAR\_SKY\_1 | MARION | SKYLINE | 6 |
| SKOCNU28 | GILA\_MORRIS1\_1 | GILA | MORRIS | 5 |
| SSCUSUN8 | ROTN\_WOLFGA1\_1 | WOLFGANG | ROTN | 5 |
| SADALAM8 | GOLDTH\_9AT2 | GOLDTH | GOLDTH | 4 |
| SBOSELM5 | 1030\_\_B | BOSQUESW | RGH | 4 |
| SBRAUVA8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 4 |
| SCRDLOF9 | POS\_SHAN\_1 | SHANNON | POSTOKSW | 4 |
| SGILNU78 | GILA\_MORRIS1\_1 | GILA | MORRIS | 4 |
| DFERPAL8 | 38T365\_1 | WIRTZ | FLATRO | 3 |
| SBATFRO8 | 13998T485\_1 | FRONTERA | GOODWIN | 3 |
| SCOLPAW5 | MAGRUD\_VICTOR2\_1 | VICTORIA | MAGRUDER | 3 |
| SSNDAU15 | 450\_\_A | SNDSW | AUSTRO | 3 |
| XLOB89 | BRUNI\_69\_1 | BRUNI | BRUNI | 3 |
| XVIC89 | MAGRUD\_VICTOR2\_1 | VICTORIA | MAGRUDER | 3 |
| BASE CASE | SNYDER\_WKN\_BK1\_1 | ENAS | WKN\_BKR | 2 |
| SALII\_D8 | I\_DUPP\_I\_DUPS1\_1 | I\_DUPP1 | I\_DUPSW | 2 |
| SBEVASH8 | BAT\_CRST\_1 | BATESVL | CRSTLSW | 2 |
| SKLELOY8 | LOYOLA\_69\_1 | LOYOLA | LOYOLA | 2 |
| SL\_FLA\_8 | LA\_PAL\_VCAVAZ1\_1 | LA\_PALMA | VCAVAZOS | 2 |
| SMASFOR8 | CORONA\_AT4 | CORONA | CORONA | 2 |
| SSPUASP8 | ROTN\_WOLFGA1\_1 | WOLFGANG | ROTN | 2 |
| XESK89 | ABNW\_ELYT1\_1 | ABNW | ELYT | 2 |
| XLY2T58 | LYTTON\_S\_AT1H | LYTTON\_S | LYTTON\_S | 2 |
| XSA2C89 | SAPOWER\_69T1 | SAPOWER | SAPOWER | 2 |
| XSA2N89 | SACH\_69T1 | SACH | SACH | 2 |
| BASE CASE | LN\_86\_1 | EXN | EXN | 1 |
| BASE CASE | LON\_HI\_SMITH1\_1 | LON\_HILL | SMITH | 1 |
| BASE CASE | MCADO\_SPUR\_1A\_1 | MWEC | SPUR | 1 |
| BASE CASE | SSI\_TLINE\_1 | FLTCK | FLTCK | 1 |
| DENTSCS5 | NCDSE\_MR1H | NCDSE | NCDSE | 1 |
| DGARHIC8 | CKT\_1027\_1 | DUNLAP | DECKER | 1 |
| DGARHIC8 | DUNLAP\_AT1 | DUNLAP | DUNLAP | 1 |
| DLONOR58 | EDROY\_MATHIS1\_1 | EDROY | MATHIS | 1 |
| DNEDPAL8 | ADERHO\_ELSA1\_1 | ADERHOLD | ELSA | 1 |
| DSTPWHI5 | BLESSI\_LOLITA1\_1 | BLESSING | LOLITA | 1 |
| DTRCELK5 | 960\_\_D | JKSVL | FLINT | 1 |
| DTRSENT5 | NCDSE\_MR1H | NCDSE | NCDSE | 1 |
| DWH\_STP5 | BLESSI\_LOLITA1\_1 | BLESSING | LOLITA | 1 |
| SCOLBAL8 | BALG\_HUMBLT1\_1 | BALG | HUMBLTAP | 1 |
| SCOLPAW5 | COLETO\_KENEDS1\_1 | COLETO | KENEDSW | 1 |
| SCRDOL29 | 6840\_\_A | CRDSW | ANARN | 1 |
| SECRBRA8 | 6240\_\_A | SACRC | SNYDR | 1 |
| SFORGIL8 | CORONA\_AT4 | CORONA | CORONA | 1 |
| SFORGIL8 | FRPHIL\_GILLES1\_1 | GILLES | FRPHILLT | 1 |
| SMARZOR5 | 419T419\_1 | CLEASP | MARION | 1 |
| SOXYIN28 | I\_DUPP\_I\_DUPS1\_1 | I\_DUPP1 | I\_DUPSW | 1 |
| SPAWLON5 | BONIVI\_RINCON1\_1 | RINCON | BONIVIEW | 1 |
| SRICGRS8 | 6850\_\_B | NVKSW | ARCTY | 1 |
| SSCLWF18 | NVKSW\_FMR1 | NVKSW | NVKSW | 1 |
| SSPUASP8 | JATN\_SPUR\_1C\_1 | GIRA\_TAP | DKEC | 1 |
| SSPUASP8 | SPUR\_69\_1 | SPUR | SPUR | 1 |
| UENAENA1 | ECRSW\_FMR1 | ECRSW | ECRSW | 1 |
| XBLE58 | SAR\_FRAN\_1 | FRANKC | SARGNTS | 1 |
| XLO2N58 | BONIVI\_RINCON1\_1 | RINCON | BONIVIEW | 1 |
| XRIO358 | CELANE\_KLEBER1\_1 | CELANEBI | KLEBERG | 1 |
| XSA2N89 | SAPOWER\_69T1 | SAPOWER | SAPOWER | 1 |