

**June 2015 ERCOT Monthly Operations Report**

**Reliability and Operations Subcommittee Meeting**

**July 9, 2015**

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# Report Highlights

* The unofficial ERCOT peak for June was 61,741 MW.
* There were five frequency events in June. PMU data indicates the ERCOT system transitioned well in each case.
* There were five instances where Responsive Reserves were deployed, all of which were the result of frequency events.
* There were eight RUC commitments in June. Three in South Central for the purpose of relieving local congestion. Five in the Southern region due to the Valley import and for the purpose of relieving local congestion.
* The level of reportable SCED congestion decreased in June. This congestion was due primarily to planned outages and area load/gen patterns. There were seven days of activity on the Zorillo - Ajo Generic Transmission Constraint (GTC) in June.
* There were no significant system events for the month of June.
* ERCOT Applications performed well throughout the month. There were no ERCOT related application performance issues.

# Frequency Control

## Frequency Events

The ERCOT Interconnection experienced six frequency events in June, all of which resulted from Resource trips. The average event duration was approximately 0:04:39.

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

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date and Time** | **Delta Frequency** | **Max/Min Frequency** | **Duration of Event** | **PMU Data** | **Comments** |
| **(Hz)** | **(Hz)** | **Oscillation Mode (Hz)** | **Damping Ratio** |
| 6/9/2015 14:06:23 | 0.06 | 59.91 | 0:05:10 | PMU Data Not Available. | Unit Trip of 690 MW  |
| 6/17/2015 13:14:39 | 0.08 | 59.89 | 0:04:06 | 0.66 | 9% | Unit Trip of 534 MW |
| 6/22/2015 2:10:04 | 0.05 | 59.88 | 0:04:47 | 0.92 | 24% | Unit Trip of 471 MW |
| 0.66 | 5% |
| 6/25/2015 23:08:49 | 0.09 | 59.88 | 0:03:54 | PMU Data Not Available. | Unit Trip of 645 MW |
| 6/26/2015 10:43:02 | 0.08 | 59.89 | 0:04:41 | 0.60 | 10% | Unit Trip of 639 MW |

(Note: frequency events highlighted in blue have been identified as FMEs per BAL-001-TRE-1 and the Performance Disturbance Compliance Working group.)



## Responsive Reserve Events

There were five events where Responsive Reserve MWs were released to SCED in June. 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** |
| 6/9/2015 14:07:34 | 6/9/2015 14:11:09 | 0:03:35 | 231.48 |  |
| 6/17/2015 13:14:37 | 6/17/2015 13:17:39 | 0:03:02 | 176.95 |  |
| 6/22/2015 2:10:11 | 6/22/2015 2:12:36 | 0:02:25 | 177.95 |  |
| 6/25/2015 23:09:25 | 6/25/2015 23:12:21 | 0:02:56 | 140.71 |  |
| 6/26/2015 10:43:13 | 6/26/2015 10:46:29 | 0:03:16 | 60.23 |  |

## Load Resource Events

There were no load resource deployment events in June.

# Reliability Unit Commitment

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

There were no DRUC commitments in June.

|  |
| --- |
| **HRUC Commitments** |
| **Resource Location** | **# of Resources** | **Operating Day** | **Total # of Hours Committed** | **Total MWhs** | **Reason for commitment** |
| S. Central | 1 | 6/2/2015 | 16 | 5120 | Local Congestion  |
| Southern | 1 | 6/2/2015 | 3 | 119 | Local Congestion  |
| Southern | 2 | 6/2/2015 | 2 | 549 | Local Congestion |
|
| S. Central | 1 | 6/3/2015 | 13 | 5460 | Local Congestion  |
| Southern | 1 | 6/3/2015 | 3 | 120 | Local Congestion  |
| Southern | 1 | 6/3/2015 | 1 | 40 | Local Congestion  |
| S. Central | 1 | 6/4/2015 | 9 | 3780 | Local Congestion  |
| Southern | 1 | 6/4/2015 | 8 | 2584 | Local Congestion  |

# Wind Generation as a Percent of Load



# Congestion Analysis

The number of congestion events experienced by the ERCOT system decreased in June due to planned outages and area load/gen patterns. There were seven days of activity on the Generic Transmission Constraints (GTCs) in June.

## Notable Constraints for June

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 June, please see Appendix A at the end of this report.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contingency** | **Overload** | **# of Days Constraint Active** | **Estimated Congestion Rent** | **Transmission Project** |
| Bevo Substation - Asherton 138 kV | Hamilton Road - Maverick 138 kV | 4 | $6,277,750 | 16TPIT0024May -18 |
| Hutto Switch Axfmr 1 (3) 345/138 kV | Gilleland - Pflugerville 138 kV | 4 | $5,338,627 | 16TPIT0062 Dec-16 |
| San Angelo College Hills 138\_69T1 138/69 kV | SA Power 69T1 138/69 kV | 5 | $3,171,839 |  |
| Key Sub - Willow Valley Switch 138 kV | Getty Vealmoor - Getty Vealmor Tap 138 kV | 1 | $2,484,327 |  |
| San Angelo North 138\_69T1 138/69kV | San Angelo College Hills 138\_69T1 138/69 kV | 4 | $2,330,406 | 3663May-17 |
| Key Sub - Willow Valley Switch 138 kV | Big Spring Crmwd Tap - Big Spring Switch 69 kV | 4 | $1,428,088 |  |
| Chevron Has - Wickett Whiting Oil 138 kV | Northward - Wink Sub 69 kV | 1 | $1,462,680 |  |
| Eagle Mountain SES - Parker Switch and Hicks Switch 345kv | Calmont Switch - Western Hills 138 kV | 1 | $1,231,288 |  |
| DCKT West Levee Switch - 800/900 Network 138 kV | East Levee Switch - Reagan Street 138 kV (3410\_A) | 3 | $1,165,225 | 2014-NC28May-16 |
| DCKT Calaveras-Hotwells and Laredo1 138 kV | Calaveras - Streich 138 kV | 6 | $1,068,299 | 16TPIT0011Jun-16 |
| Poacks - City of College Station 138 kV Switch 138 kV | City of College Station 138 kV Switch - Cssc 138 kV | 5 | $535,704 | 4411Jul-16 |
| Saldo - Killeen Switch 345 kV | Belton - Belton Southwest 138 kV | 3 | $483,750 |  |
| Eagle Mountain SES - Saginaw Switch 138 kV | Eagle Mountain SES - Morris Dido 138 kV | 3 | $427,106 | 4253 May-18 |
| Bluff Creek T2 (3) 345/138 kV | Bluff Creek T1 (3) 345/138 kV | 3 | $351,393 |  |
| Dunlap - Austrop and Lostpine 34 kV | Austrop AT2H 345/138 kV | 4 | $348,196 |  |
| DCKT Jewett - Singleton 345 kV | Twin Oak Switch - Btu\_Jack\_Creek 345 kV | 9 | $330,793 |  |
| Basecase | Zorillo - Ajo GTC | 6 | $257,269 |  |
| DCKT Marion - Zorn and Clear Springs 345 kV | Cibolo - Schertz 138 kV | 4 | $232,783 |  |
| Fppyd1-Salem and Fayett 345kv | Austrop - Sim Gideon 138 kV | 3 | $213,028 |  |
| Laquinta - Lobo 138 kV | Bruni 138\_69\_1 138/69 kV | 10 | $179,697 |  |
| Marion - Zorn 345 kV | Clear Springs - Marion 345 kV | 10 | $155,539 |  |
| Roans Prarie - Rothwood and Singleton - Tomball 345 kV | Singleton - Zenith 345 kV (SNGZEN99) | 6 | $132,726 | 2013-R63 |
| Lobo - San Miguel 345\_138 kV Switchyards 345 kV | San Diego - Freer 69kV | 5 | $62,647 |  |
| DCKT Marion - Zorn and Clear Springs 345 kV | Comal - Loop 337 138 kV | 7 | $27,797 |  |
| DCKT Ferguson - Granite Mountain and Wirtz - Starcke - Paleface 138 kV | Wirtz - Flat Rock Lcra 138 kV | 6 | $28,729 | 4465May-19 |
| Cottonwood Road Switch - Loftin 69 kV | Shannon - Post Oak Switch 69 kV | 7 | $14,920 | 15TPIT0011 |

## Generic Transmission Constraint Congestion

There were seven days of activity on the Zorillo - Ajo GTC in June. There was no activity on the remaining GTCs during the Month of June.

## Manual Overrides for June

There were no manual overrides for the month of June 2015

## 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** |
| DKCT Roans Prarie-Rothwood & Singleton-Tomball 345kV | Singleton - Zenith 345 kV (SNGZEN99) | 2,000 |  $ 17,805,924.33  | 2013-R63    |
| Topeka Termination - West Levee Switch 345 kV | Cedar Hill Switch - Mountain Creek 138 kV | 356 |  $ 8,199,322.66  | 13TPIT0060 |
| DCKT Hill Country - Marion and Elmcreek 345 kV | Marion - Skyline 345 kV | 1,188 |  $ 7,610,819.02  | 4081 |
| San Angelo North 138\_69T1 138/69kV | San Angelo College Hills 138\_69T1 138/69 kV | 5,663 |  $ 7,348,255.62  | 3663 |
| DCKT Lost Pines - Austrop & Dunlop 345 kV | Fayette Plant 1 - Fayette Plant 2 345 kV | 620 |  $ 6,624,462.39  |   |
| Bevo Substation - Asherton 138 kV | Hamilton Road - Maverick 138 kV | 2,975 |  $ 6,277,749.92  | 16TPIT0024 |
| Orange Grove Switching Station - Lon Hill 138 kV | Lon Hill - Smith 69 kV | 1,008 |  $ 6,052,131.26  | 16TPIT0026 |
| DCKT Jewett - Singleton 345 kV | Twin Oak Switch - Btu\_Jack\_Creek 345 kV | 3,206 |  $ 5,573,653.67  |   |
| Los Fresnos - Loma Alta Substation 138 kV | La Palma - Villa Cavazos 138 kV | 513 |  $ 5,485,885.25  |   |
| Hutto Switch Axfmr 1 (3) 345/138 kV | Gilleland - Pflugerville 138 kV | 589 |  $ 5,338,627.43  | 16TPIT0062 |
| Rio Hondo (2H) Axfmr 345/138 kV | Aderhold - Elsa 138 kV | 272 |  $ 4,745,657.61  |   |
| Falcon Seaboard - Midland East 345 kV | Odessa to Glenhaven 138 kV | 70 |  $ 4,268,830.85  | 4173 |
| Bates - Frontera 138 kV | Frontera - Goodwin 138 kV | 78 |  $ 4,074,787.83  |   |
| Falcon Seaboard to Morgan Creek Ses 345 KV | Glenhaven - Crmwd 8 Tap 138 kV | 249 |  $ 4,063,954.92  | 4173 |
| DCKT West Levee Switch - 800/900 Network 138 kV | East Levee Switch - Reagan Street 138 kV (3410\_A) | 277 |  $ 3,829,432.69  | 2014-NC28 |
| DCKT Calaveras-Hotwells & Laredo1 138 kV | Calaveras - Streich 138 kV | 752 |  $ 3,750,145.76  | 16TPIT0011 |
| San Angelo College Hills 138\_69T1 138/69 kV | SA Power 69T1 138/69 kV | 757 |  $ 3,568,527.32  |   |
| South Mission to Frontera 138/138 KV | North McAllen to West McAllen | 70 |  $ 3,335,332.47  |   |
| Barber Lake Swtich - Morgan Creek Ses 138 kV (14030) | Barber Lake Swtich - Morgan Creek Ses 138 kV (14035) | 80 |  $ 3,040,753.33  | 15TPIT0087 |
| Basecase | North to Houston | 93 |  $ 3,027,252.14  | 2013-R63    |

# System Events

## ERCOT Peak Load

The unofficial ERCOT peak load for the month was 61,741 MW and occurred on June 10th 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 reportable events in June.

## TRE/DOE Reportable Events

None.

## New/Updated Constraint Management Plans

Thirteen Constraint Management Plans were added in the month of June. Three remedial action plans and 10 mitigation plans.

* SSALFPP5: Salem To Fayette Power Plant 345Kv Line
* MP\_2015\_11: Forest Hill 138/69 kV Autotransformer
* MP\_2015\_09: Wink TNMP 138/69 kV Autotransformer OR Wink TNMP - Wink Oncor 138 kV Line
* MP\_2015\_08: Hutto - Round Rock/Gabriel 138kV Double Circuit Line
* MP\_2015\_07: Permian Basin 138/69 kV Autotransformer #1 OR Autotransformer #2
* MP\_2015\_06: Leon-Breckenridge 69 kV Line (Leon-Eastland)
* MP\_2015\_04: Henrietta Sw. - Bowie/Montague Sw. 69 kV Line (Bellevue - Montague Sw.)
* MP\_2015\_02: Fort Lancaster - Mesa View Switch 138kV line
* MP\_2014\_08: San Miguel to Sigmor 138 kV Line
* MP\_2010\_13: Jacksonville 138/69 kV Autotransformer # 1 (XJKS89-T1)
* DSALFA58: Salem To Fayette Power Plant 345Kv Line And Salem - Fayetteville 138Kv Line
* DNAVLEG5: Allen Sw - Royse/Monticello Double Circuit 345 kV Line
* MP\_2015\_03: Gillespie County

## New/Modified/Removed SPS

None.

## New Procedures/Forms/Operating Bulletins

None.

# Emergency Conditions

## OCNs

|  |  |
| --- | --- |
| **Date and Time** | **Description** |
| 06/12/15 15:55 | ERCOT issued an OCN due to the development of a new Generic Transmission Constraint (GTC) due to a local voltage stability issue. |
| 06/15/15 21:42 | ERCOT issued an OCN due to Tropical Storm Bill approaching the ERCOT service area. |

## Advisories

|  |  |
| --- | --- |
| **Date and Time** | **Description** |
| 06/22/15 14:33 | ERCOT issued an Advisory for a geomagnetic disturbance of K7 and K8. |

## Watches

None.

## Emergency Notices

None.

# Application Performance

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

## TSAT/VSAT Performance Issues

None.

## Communication Issues

None.

## Market System Issues

None.

# Net-Forecast Bias Applied to NSRS Procurement for July 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 June, 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 June. 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** |
| SLAQLOB8 | BRUNI\_69\_1 | BRUNI | BRUNI | 10 |
| SMARZOR5 | 419T419\_1 | CLEASP | MARION | 10 |
| DJEWSNG5 | JK\_TOKSW\_1 | TOKSW | JK\_CK | 9 |
| DMARZOR5 | 91T335\_1 | COMAL | LOP337 | 7 |
| SCRDLOF9 | POS\_SHAN\_1 | SHANNON | POSTOKSW | 7 |
| BASE CASE | ZO\_AJO |   |   | 6 |
| DCALHOT8 | N4\_X3\_1 | CALAVERS | X3 | 6 |
| DFERPAL8 | 38T365\_1 | WIRTZ | FLATRO | 6 |
| DRNS\_TB5 | SNGZEN99\_A | SNG | ZEN | 6 |
| SLOBSAN5 | FREER\_SAN\_DI1\_1 | SAN\_DIEG | FREER | 5 |
| SPOACSS8 | CSSWCS-CSSC\_1 | CSSWCS | CSSC | 5 |
| XSA2C89 | SAPOWER\_69T1 | SAPOWER | SAPOWER | 5 |
| DDUNLOS5 | AUSTRO\_AT2H | AUSTRO | AUSTRO | 4 |
| DMARZOR5 | 293T304\_1 | CIBOLO | SCHERT | 4 |
| SBEVASH8 | HAMILT\_MAVERI1\_1 | HAMILTON | MAVERICK | 4 |
| SKEYWLV8 | 6610\_\_D | BSPSW | BSCTP | 4 |
| XHUT58 | 1666\_\_B | GILLCR | PFLGV | 4 |
| XSA2N89 | SACH\_69T1 | SACH | SACH | 4 |
| DEMSSAG8 | 6265\_\_A | EMSES | MRSDO | 3 |
| DFPPFAY5 | 197T171\_1 | AUSTRO | GIDEON | 3 |
| DSALKLN5 | 630\_\_A | BLTON | BLTSW | 3 |
| DWLV89N8 | 3410\_\_A | ELVSW | REGST | 3 |
| XBL2U58 | BLUF\_CRK\_T1\_H | BLUF\_CRK | BLUF\_CRK | 3 |
| DCLEZOR5 | 99T203\_1 | ZORN | YORKCR | 2 |
| DGARHIC8 | CKT\_1027\_1 | DUNLAP | DECKER | 2 |
| DMARPA\_8 | 38T365\_1 | WIRTZ | FLATRO | 2 |
| DTRCELK5 | 1775\_\_C | TYLNE | DLPOI | 2 |
| SLOBSAN5 | LAQUIN\_LOBO1\_1 | LAQUINTA | LOBO | 2 |
| XLY2T58 | LYTTON\_S\_AT1H | LYTTON\_S | LYTTON\_S | 2 |
| DAUSGAR5 | CKT\_1027\_1 | DUNLAP | DECKER | 1 |
| DAUSSND5 | 1661\_\_B | HUTTO | RRNES | 1 |
| DDUNLOS5 | CKT\_920\_1 | AUSTRO | DUNLAP | 1 |
| DEMSHCK5 | 6185\_\_A | CMTSW | WSTHL | 1 |
| DGABBEL8 | 1661\_\_B | HUTTO | RRNES | 1 |
| DGIBSNG5 | 260\_A\_1 | JEWET | SNG | 1 |
| DHCKRNK5 | EMSES\_AX2H | EMSES | EMSES | 1 |
| DHUTGAB8 | 211T147\_1 | GILLCR | MCNEIL\_ | 1 |
| DLWSRNK5 | 1060\_\_F | RNKSW | MCPHERSN | 1 |
| DMARZOR5 | 498T498\_1 | MCQUEE | SCHUMA | 1 |
| DMCSCDH8 | 3150\_\_A | CDCSW | OKCLS | 1 |
| DWH\_STP5 | AIRCO4\_RINCON1\_1 | RINCON | AIRCO4 | 1 |
| SAJORI25 | CELANE\_KLEBER1\_1 | CELANEBI | KLEBERG | 1 |
| SATKDAN8 | NAL\_BRIR\_1 | NALL\_LN | BRIRCRT | 1 |
| SHICGAR8 | CKT\_962\_1 | GARFIELD | STONEY\_R | 1 |
| SHSAPBS8 | 6917\_\_B | NWARD | WINKS | 1 |
| SHWRWEL8 | 1163T163\_1 | MCNEIL\_ | HWRDTP | 1 |
| SKEYWLV8 | 6135\_\_E | GVLTP | GYVLM | 1 |
| SKEYWLV8 | 6610\_\_A | CHATP | BUZSW | 1 |
| SL\_FLA\_8 | LA\_PAL\_VCAVAZ1\_1 | LA\_PALMA | VCAVAZOS | 1 |
| SRDODES8 | 940\_\_C | ENWSW | WXHCH | 1 |
| SSALFPP5 | FAYETT\_6AT2 | FAYETT | FAYETT | 1 |
| SSAMTH35 | 505\_\_A | THSES | SAMSW | 1 |
| SSCUSUN8 | ROTN\_WOLFGA1\_1 | WOLFGANG | ROTN | 1 |
| SSPUASP8 | JATN\_SPUR\_1C\_1 | GIRA\_TAP | DKEC | 1 |
| SSPUASP8 | ROTN\_WOLFGA1\_1 | WOLFGANG | ROTN | 1 |
| SSPUASP8 | SPUR\_69\_1 | SPUR | SPUR | 1 |
| STRIDEC8 | CKT\_1027\_1 | DUNLAP | DECKER | 1 |
| SVICCO28 | COLETO\_VICTOR2\_1 | COLETO | VICTORIA | 1 |
| SW\_BASH8 | BAT\_CRST\_1 | BATESVL | CRSTLSW | 1 |
| SWILJA28 | 560\_\_B | BRGPR | BTPTM | 1 |
| XASP89 | MUNDAY\_WEIN1\_1 | MUNDAYST | WEIN | 1 |
| XGEO89 | CSA\_ORN\_1 | ORNGRVS | CASA\_BLA | 1 |
| XLOB58 | DILLEY\_JARDIN1\_1 | DILLEYSW | JARDIN | 1 |
| XMDL58 | 6465\_\_B | SBYSW | MDDTN | 1 |
| XNED358 | S104A\_1 | RIOHONDO | MV\_BURNS | 1 |
| XORN89 | LOYOLA\_69\_1 | LOYOLA | LOYOLA | 1 |
| XSA2N89 | SAPOWER\_69T1 | SAPOWER | SAPOWER | 1 |
| XWL2V58 | 3130\_\_B | INDST | CMPST | 1 |