|  |  |  |  |
| --- | --- | --- | --- |
| NPRR Number | [1100](http://www.ercot.com/mktrules/issues/NPRR1100) | NPRR Title | Allow Generation Resources and Energy Storage Resources to Serve Customer Load When the Customer and the Resource are Disconnected from the ERCOT System |
| Date of Decision | | June 21, 2022 | |
| Action | | Recommended Approval | |
| Timeline | | Urgent | |
| Proposed Effective Date | | July 15, 2022 | |
| Priority and Rank Assigned | | Not applicable | |
| Nodal Protocol Sections Requiring Revision | | 2.1, Definitions  2.2, Acronyms and Abbreviations  3.9.1, Current Operating Plan (COP) Criteria  6.4.7, QSE-Requested Decommitment of Resources and Changes to Ancillary Service Resource Responsibility of Resources  6.5.5.1, Changes in Resource Status  6.5.6, TSP and DSP Responsibilities  6.6.13, Wholesale Storage Load Reconciliation for ESRs Operating in a Private Microgrid Island (new)  10.3.2.3, Generation Netting for ERCOT-Polled Settlement Meters | |
| Related Documents Requiring Revision/Related Revision Requests | | None | |
| Revision Description | | This Nodal Protocol Revision Request (NPRR) clarifies that a Generation Resource or Energy Storage Resource (ESR) may serve Customer Load in any circumstance in which the Customer and the Resource are both disconnected from the ERCOT System due to an Outage of the transmission or distribution system. It is limited to configurations where the Resource and Customer Load are using privately owned transmission and distribution infrastructure during the Private Microgrid Island (PMI) operation. This is not a Private Use Network and the Load and Resource do not net during normal circumstances.  For PMIs with an ESR, after the initial Settlement of an Operating Day in which the private microgrid operated as a PMI, this NPRR proposes an adjustment to ensure that consumption by the ESR prior to the PMI operation period and subsequently used to serve the Customer during private microgrid operation is no longer treated as Wholesale Storage Load (WSL). This adjustment will recharacterize the Load from WSL to Non-WSL on an Operating Day basis for as many Operating Days as necessary to ensure that ESR Load not eligible for WSL treatment is not provided WSL treatment. | |
| Reason for Revision | | Addresses current operational issues.  Meets Strategic goals (tied to the [ERCOT Strategic Plan](http://www.ercot.com/content/wcm/lists/144926/ERCOT_Strategic_Plan_2019-2023.pdf) or directed by the ERCOT Board).  Market efficiencies or enhancements  Administrative  Regulatory requirements  Other: (explain)  *(please select all that apply)* | |
| Business Case | | This NPRR allows a Resource to provide resiliency benefits to one or more privately connected Loads in the event that both the Resource and Load are disconnected from the ERCOT System. | |
| Credit Work Group Review | | ERCOT Credit Staff and the Credit Work Group (Credit WG) have reviewed NPRR1100 and do not believe that it requires changes to credit monitoring activity or the calculation of liability. | |
| PRS Decision | | On 11/10/21, PRS voted via roll call to table NPRR1100 and refer the issue to ROS and WMS. There was one abstention from the Consumer (Occidental Chemical) Market Segment. All Market Segments participated in the vote.  On 4/14/22, PRS voted via roll call to grant NPRR1100 Urgent status; and to table NPRR1100. There was one abstention from the Consumer (Residential Consumer) Market Segment. All Market Segments participated in the vote.  On 5/11/22, PRS voted unanimously to recommend approval of NPRR1100 as amended by the 5/3/22 ERCOT comments; and to forward to TAC NPRR1100. All Market Segments participated in the vote. | |
| Summary of PRS Discussion | | On 11/10/21, there was no discussion.  On 4/14/22, participants reviewed the 4/12/22 Oncor comments, the 4/12/22 LCRA comments, and the 4/13/22 ERCOT comments. Participants requested additional time to review.  On 5/11/22, participants noted the endorsement of the 5/3/22 ERCOT comments in the 5/10/22 ROS comments and 5/10/22 WMS comments. | |
| TAC Decision | | On 5/25/22, TAC voted unanimously to recommend approval of NPRR1100 as recommended by PRS in the 5/11/22 PRS Report as amended by the 5/19/22 Oncor comments; and the 5/18/22 Impact Analysis with a proposed effective date of July 15, 2022. All Market Segments participated in the vote. | |
| Summary of TAC Discussion | | On 5/25/22, TAC reviewed the ERCOT Opinion, the ERCOT Market Impact Statement, the 5/19/22 Oncor comments, and the 5/18/22 Impact Analysis for NPRR1100. | |
| ERCOT Opinion | | ERCOT supports approval of NPRR1100. | |
| ERCOT Market Impact Statement | | ERCOT Staff has reviewed NPRR1100 and believes the market impact for NPRR1100 allows a Resource to provide resiliency benefits to one or more privately connected Loads in the event that the Resource and Load are disconnected from the ERCOT System due to an Outage of the transmission or distribution system. | |
| ERCOT Board Decision | | On 6/21/22, the ERCOT Board voted unanimously to recommend approval of NPRR1100 as recommended by TAC in the 5/25/22 TAC Report. | |

|  |  |
| --- | --- |
| Sponsor | |
| Name | Arushi Sharma Frank |
| E-mail Address | [asharmafrank@tesla.com](mailto:asharmafrank@tesla.com) |
| Company | Tesla Energy Operations Inc. d/b/a Tesla |
| Phone Number | 571-572-9037 |
| Cell Number |  |
| Market Segment | Independent Generator |

|  |  |
| --- | --- |
| **Market Rules Staff Contact** | |
| **Name** | Cory Phillips |
| **E-Mail Address** | [Cory.phillips@ercot.com](mailto:Cory.phillips@ercot.com) |
| **Phone Number** | 512-248-6464 |

|  |  |
| --- | --- |
| **Comments Received** | |
| Comment Author | **Comment Summary** |
| Tesla 110321 | Proposed edits to expand the proposed emergency switching solution to all Resources along with other revisions to clarify the application of the switching solution, appropriate Resource Status, WSL treatment, and metering expectations |
| ROS 120321 | Requested PRS continue to table NPRR1100 for review by the Operations Working Group (OWG) |
| WMS 120621 | Requested PRS continue to table NPRR1100 for further discussion by the Metering Working Group (MWG) and the Wholesale Market Working Group (WMWG) |
| Tesla 021422 | Proposed additional edits based on stakeholder discussions at OWG, MWG, and WMWG |
| ERCOT 040522 | Proposed additional edits to the 2/14/22 Tesla comments based on internal discussions and stakeholder discussions at OWG, MWG, and WMWG to present a more simplified approach from both an operational and Settlement perspective |
| Oncor 041222 | Proposed additional edits to the 4/5/22 ERCOT comments to relocate proposed language from Section 6.5.6, TSP and DSP Responsibilities, into Section 6.5.5.1 |
| LCRA 041222 | Proposed additional edits to the 4/12/22 Oncor comments to improve Transmission and/or Distribution Service Provider (TDSP) coordination with Resources engaged in a PMI |
| ERCOT 041322 | Responded to the 4/12/22 Oncor comments and 4/12/22 LCRA comments, and proposed additional edits to the 4/12/22 LCRA comments within paragraph (4)(a)(iv) of Section 6.5.5.1 |
| LCRA 050222 | Proposed additional clarifying edits to the 4/13/22 ERCOT comments |
| ERCOT 050322 | Proposed additional edits to the 5/2/22 LCRA comments clarifying the notifications and communications concerning PMI configurations |
| ROS 051022 | Endosed NPRR1100 as amended by the 5/3/22 ERCOT comments |
| WMS 051022 | Endosed NPRR1100 as amended by the 5/3/22 ERCOT comments |
| Oncor 051922 | Proposed additional edits to include a notification from the Qualified Scheduling Entity (QSE) to the interconnecting TDSP(s) regarding the time of initiation and conclusion of any PMI operations |

|  |
| --- |
| **Market Rules Notes** |

Please note that the baseline language in the following section(s) has been updated to reflect the incorporation of the following NPRR(s) into the Protocols:

* NPRR1005, Clarify Definition of Point of Interconnection (POI) and Add Definition Point of Interconnection Bus (POIB) (unboxed 2/1/22)
  + Section 10.3.2.3
* NPRR1092, Reduce RUC Offer Floor and Limit RUC Opt-Out Provision
  + Section 6.4.7 (incorporated 5/13/22)
* NPRR1098, Direct Current Tie (DC Tie) Reactive Power Capability Requirements (incorporated 4/1/22)
  + Section 6.5.6
* NPRR1093, Load Resource Participation in Non-Spinning Reserve (unboxed 5/27/22)
  + Section 3.9.1

Please note that the following NPRR(s) also propose revisions to the following section(s):

* NPRR1085, Ensuring Continuous Validity of Physical Responsive Capability (PRC) and Dispatch through Timely Changes to Resource Telemetry and Current Operating Plans (COPs)
  + Section 3.9.1
  + Section 6.5.5.1

|  |
| --- |
| Proposed Protocol Language Revision |

**2.1 DEFINITIONS**

**Private Microgrid Island (PMI)**

A temporary configuration in which a Resource provides electricity to Customer Load through privately-owned transmission and/or distribution infrastructure when the Resource and Customer Load are disconnected from the ERCOT System due to an Outage on the transmission and/or distribution system.

**2.2 ACRONYMS AND ABBREVIATIONS**

**PMI** Private Microgrid Island

***3.9.1 Current Operating Plan (COP) Criteria***

(1) Each QSE that represents a Resource must submit a COP to ERCOT that reflects expected operating conditions for each Resource for each hour in the next seven Operating Days.

(2) Each QSE that represents a Resource shall update its COP reflecting changes in availability of any Resource as soon as reasonably practicable, but in no event later than 60 minutes after the event that caused the change.

(3) The Resource capacity in a QSE’s COP must be sufficient to supply the Ancillary Service Supply Responsibility of that QSE.

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Replace applicable portions of paragraph (3) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029:]***  (3) Each QSE that represents a Resource shall update its COP to reflect the ability of the Resource to provide each Ancillary Service by product and sub-type. |

(4) Load Resource COP values may be adjusted to reflect Distribution Losses in accordance with Section 8.1.1.2, General Capacity Testing Requirements.

(5) A COP must include the following for each Resource represented by the QSE:

(a) The name of the Resource;

(b) The expected Resource Status:

(i) Select one of the following for Generation Resources synchronized to the ERCOT System that best describes the Resource’s status. Unless otherwise provided below, these Resource Statuses are to be used for COP and/or Real-Time telemetry purposes, as appropriate.

(A) ONRUC – On-Line and the hour is a RUC-Committed Hour;

(B) ONREG – On-Line Resource with Energy Offer Curve providing Regulation Service;

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete item (B) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029; and renumber accordingly.]*** |

(C) ON – On-Line Resource with Energy Offer Curve;

(D) ONDSR – On-Line Dynamically Scheduled Resource (DSR);

|  |
| --- |
| ***[NPRR1000: Delete item (D) above upon system implementation and renumber accordingly.]*** |

(E) ONOS – On-Line Resource with Output Schedule;

(F) ONOSREG – On-Line Resource with Output Schedule providing Regulation Service;

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete item (F) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029; and renumber accordingly.]*** |

(G) ONDSRREG – On-Line DSR providing Regulation Service;

|  |
| --- |
| ***[NPRR1000, NPRR1007, NPRR1014, and NPRR1029: Delete item (G) above upon system implementation for NPRR1000, NPRR1014, or NPRR1029; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; and renumber accordingly.]*** |

(H) FRRSUP – Available for Dispatch of Fast Responding Regulation Service (FRRS). This Resource Status is only to be used for Real-Time telemetry purposes;

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete item (H) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 and NPRR1029; and renumber accordingly.]*** |

(I) ONTEST – On-Line blocked from Security-Constrained Economic Dispatch (SCED) for operations testing (while ONTEST, a Generation Resource may be shown on Outage in the Outage Scheduler);

(J) ONEMR – On-Line EMR (available for commitment or dispatch only for ERCOT-declared Emergency Conditions; the QSE may appropriately set LSL and High Sustained Limit (HSL) to reflect operating limits);

(K) ONRR – On-Line as a synchronous condenser providing Responsive Reserve (RRS) but unavailable for Dispatch by SCED and available for commitment by RUC;

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete item (K) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029; and renumber accordingly.]*** |

|  |
| --- |
| ***[NPRR863: Insert paragraph (L) below upon system implementation and renumber accordingly:]***  (L) ONECRS – On-Line as a synchronous condenser providing ERCOT Contingency Response Service (ECRS) but unavailable for Dispatch by SCED and available for commitment by RUC; |

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete item (L) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029; and renumber accordingly.]*** |

(L) ONOPTOUT – On-Line and the hour is a RUC Buy-Back Hour;

(M) SHUTDOWN – The Resource is On-Line and in a shutdown sequence, and has no Ancillary Service Obligations other than Off-Line Non-Spinning Reserve (Non-Spin) which the Resource will provide following the shutdown. This Resource Status is only to be used for Real-Time telemetry purposes;

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Replace paragraph (M) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029:]***  (H) SHUTDOWN – The Resource is On-Line and in a shutdown sequence, and is not eligible for an Ancillary Service award. This Resource Status is only to be used for Real-Time telemetry purposes; |

(N) STARTUP – The Resource is On-Line and in a start-up sequence and has no Ancillary Service Obligations. This Resource Status is only to be used for Real-Time telemetry purposes;

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Replace paragraph (N) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029:]***  (I) STARTUP – The Resource is On-Line and in a start-up sequence and is not eligible for an Ancillary Service award, unless coming On-Line in response to a manual deployment of ERCOT Contingency Reserve Service (ECRS) or Non-Spinning Reserve (Non-Spin). This Resource Status is only to be used for Real-Time telemetry purposes; |

(O) OFFQS – Off-Line but available for SCED deployment. Only qualified Quick Start Generation Resources (QSGRs) may utilize this status; and

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Replace paragraph (O) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029:]***  (J) OFFQS – Off-Line but available for SCED deployment and to provide ECRS and Non-Spin, if qualified and capable. Only qualified Quick Start Generation Resources (QSGRs) may utilize this status; |

(P) ONFFRRRS – Available for Dispatch of RRS providing Fast Frequency Response (FFR) from Generation Resources. This Resource Status is only to be used for Real-Time telemetry purposes;

|  |
| --- |
| ***[NPRR1015: Replace paragraph (P) above with the following upon system implementation of NPRR863:]***  (P) ONFFRRRS – Available for Dispatch of RRS when providing Fast Frequency Response (FFR) from Generation Resources. This Resource Status is only to be used for Real-Time telemetry purposes. A Resource with this Resource Status may also be providing Ancillary Services other than FFR; |

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete item (P) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029; and renumber accordingly.]*** |

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Insert applicable portions of items (K) and (L) below upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029:]***  (K) ONSC – Resource is On-Line operating as a synchronous condenser and available to provide Responsive Reserve (RRS) and ECRS, if qualified and capable, and for commitment by RUC, but is unavailable for Dispatch by SCED. For SCED, Resource Base Points will be set equal to the telemetered net real power of the Resource available at the time of the SCED execution; and  (L) ONHOLD – Resource is On-Line but temporarily unavailable for Dispatch by SCED or Ancillary Service awards. This Resource Status is only to be used for Real-Time telemetry purposes. For SCED, Resource Base Points will be set equal to the telemetered net real power of the Resource available at the time of the SCED execution. |

(ii) Select one of the following for Off-Line Generation Resources not synchronized to the ERCOT System that best describes the Resource’s status. These Resource Statuses are to be used for COP and/or Real-Time telemetry purposes, as appropriate.

(A) OUT – Off-Line and unavailable, or not connected to the ERCOT System and operating in a Private Microgrid Island (PMI);

(B) OFFNS – Off-Line but reserved for Non-Spin;

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete item (B) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029; and renumber accordingly.]*** |

(C) OFF – Off-Line but available for commitment in the Day-Ahead Market (DAM) and RUC;

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Replace item (C) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029:]***  (B) OFF – Off-Line but available for commitment in the Day-Ahead Market (DAM), RUC, and providing Non-Spin, if qualified and capable; |

(D) EMR – Available for commitment as a Resource contracted by ERCOT under Section 3.14.1, Reliability Must Run, or under paragraph (4) of Section 6.5.1.1, ERCOT Control Area Authority, or available for commitment only for ERCOT-declared Emergency Condition events; the QSE may appropriately set LSL and HSL to reflect operating limits;

(E) EMRSWGR – Switchable Generation Resource (SWGR) operating in a non-ERCOT Control Area, or in the case of a Combined Cycle Train with one or more SWGRs, a configuration in which one or more of the physical units in that configuration are operating in a non-ERCOT Control Area.

|  |
| --- |
|  |

(iii) Select one of the following for Load Resources. Unless otherwise provided below, these Resource Statuses are to be used for COP and/or Real-Time telemetry purposes.

(A) ONRGL – Available for Dispatch of Regulation Service by Load Frequency Control (LFC) and, for any remaining Dispatchable capacity, by SCED with a Real-Time Market (RTM) Energy Bid;

(B) FRRSUP – Available for Dispatch of FRRS by LFC and not Dispatchable by SCED. This Resource Status is only to be used for Real-Time telemetry purposes;

(C) FRRSDN - Available for Dispatch of FRRS by LFC and not Dispatchable by SCED. This Resource Status is only to be used for Real-Time telemetry purposes;

(D) ONCLR – Available for Dispatch as a Controllable Load Resource by SCED with an RTM Energy Bid;

(E) ONRL – Available for Dispatch of RRS or Non-Spin, excluding Controllable Load Resources;

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete items (A)-(E) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029; and renumber accordingly.]*** |

|  |
| --- |
| ***[NPRR863: Insert paragraph (F) below upon system implementation and renumber accordingly:]***  (F) ONECL – Available for Dispatch of ECRS, excluding Controllable Load Resources; |

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete item (F) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029; and renumber accordingly.]*** |

(F) OUTL – Not available;

|  |
| --- |
| ***[NPRR863 and NPRR1015: Insert applicable portions of paragraph (H) below upon system implementation of NPRR863:]***  (H) ONFFRRRSL – Available for Dispatch of RRS when providing FFR, excluding Controllable Load Resources. This Resource Status is only to be used for Real-Time telemetry purposes; |

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete item (H) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029.]*** |

|  |
| --- |
| ***[NPRR1007, NPRR1014, NPRR1029: Insert item (B) below upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029:]***  (B) ONL – On-Line and available for Dispatch by SCED or providing Ancillary Services. |

|  |
| --- |
| ***[NPRR1014 or NPRR1029: Insert applicable portions of paragraph (iv) below upon system implementation:]***  (iv) Select one of the following for Energy Storage Resources (ESRs). Unless otherwise provided below, these Resource Statuses are to be used for COP and Real-Time telemetry purposes:  (A) ON – On-Line Resource with Energy Bid/Offer Curve;  (B) ONOS – On-Line Resource with Output Schedule;  (C) ONTEST – On-Line blocked from SCED for operations testing (while ONTEST, an Energy Storage Resource (ESR) may be shown on Outage in the Outage Scheduler);  (D) ONEMR – On-Line EMR (available for commitment or dispatch only for ERCOT-declared Emergency Conditions; the QSE may appropriately set LSL and High Sustained Limit (HSL) to reflect operating limits);  (E) ONHOLD – Resource is On-Line but temporarily unavailable for Dispatch by SCED or Ancillary Service awards. ESRs shall not be discharging into or charging from the grid. This Resource Status is only to be used for Real-Time telemetry purposes; and  (F) OUT – Off-Line and unavailable, or not connected to the ERCOT System and operating in a Private Microgrid Island (PMI); |

(c) The HSL;

(i) For Load Resources other than Controllable Load Resources, the HSL should equal the expected power consumption;

|  |
| --- |
| ***[NPRR1014 and NPRR1029: Insert applicable portions of paragraph (ii) below upon system implementation:]***  (ii) For ESRs, the HSL may be negative; |

(d) The LSL;

(i) For Load Resources other than Controllable Load Resources, the LSL should equal the expected Low Power Consumption (LPC);

|  |
| --- |
| ***[NPRR1014 and NPRR1029: Insert applicable portions of paragraph (ii) below upon system implementation:]***  (ii) For ESRs, the LSL may be positive; |

(e) The High Emergency Limit (HEL);

(f) The Low Emergency Limit (LEL); and

(g) Ancillary Service Resource Responsibility capacity in MW for:

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Replace applicable portions of item (g) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029:]***  (g) Ancillary Service capability in MW for each product and sub-type. |

(i) Regulation Up (Reg-Up);

(ii) Regulation Down (Reg-Down);

(iii) RRS; and

|  |
| --- |
| ***[NPRR863: Insert paragraph (iv) below upon system implementation and renumber accordingly:]***  (iv) ECRS; and |

(iv) Non-Spin.

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Delete items (i)-(iv) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029.]*** |

(6) For Combined Cycle Generation Resources, the above items are required for each operating configuration. In each hour only one Combined Cycle Generation Resource in a Combined Cycle Train may be assigned one of the On-Line Resource Status codes described above.

(a) During a RUC study period, if a QSE’s COP reports multiple Combined Cycle Generation Resources in a Combined Cycle Train to be On-Line for any hour, then until the QSE corrects its COP, the On-Line Combined Cycle Generation Resource with the largest HSL is considered to be On-Line and all other Combined Cycle Generation Resources in the Combined Cycle Train are considered to be Off-Line. Furthermore, until the QSE corrects its COP, the Off-Line Combined Cycle Generation Resources as designated through the application of this process are ineligible for RUC commitment or de-commitment Dispatch Instructions.

(b) For any hour in which QSE-submitted COP entries are used to determine the initial state of a Combined Cycle Generation Resource for a DAM or Day-Ahead Reliability Unit Commitment (DRUC) study and the COP shows multiple Combined Cycle Generation Resources in a Combined Cycle Train to be in an On-line Resource Status, then until the QSE corrects its COP, the On-Line Combined Cycle Generation Resource that has been On-Line for the longest time from the last recorded start by ERCOT systems, regardless of the reason for the start, combined with the COP Resource Status for the remaining hours of the current Operating Day, is considered to be On-Line at the start of the DRUC study period and all other COP-designated Combined Cycle Generation Resources in the Combined Cycle Train are considered to be Off-Line.

(c) ERCOT systems shall allow only one Combined Cycle Generation Resource in a Combined Cycle Train to offer Off-Line Non-Spin in the DAM or Supplemental Ancillary Services Market (SASM).

|  |
| --- |
| ***[NPRR1007, NPRR1014, and NPRR1029: Replace paragraph (c) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1007; or upon system implementation for NPRR1014 or NPRR1029:]***  (c) ERCOT systems shall allow only one Combined Cycle Generation Resource in a Combined Cycle Train to offer Off-Line Non-Spin in the DAM or SCED. |

(i) If there are multiple Non-Spin offers from different Combined Cycle Generation Resources in a Combined Cycle Train, then prior to execution of the DAM, ERCOT shall select the Non-Spin offer from the Combined Cycle Generation Resource with the highest HSL for consideration in the DAM and ignore the other offers.

(ii) Combined Cycle Generation Resources offering Off-Line Non-Spin must be able to transition from the shutdown state to the offered Combined Cycle Generation Resource On-Line state and be capable of ramping to the full amount of the Non-Spin offered.

(d) The DAM and RUC shall honor the registered hot, intermediate or cold Startup Costs for each Combined Cycle Generation Resource registered in a Combined Cycle Train when determining the transition costs for a Combined Cycle Generation Resource. In the DAM and RUC, the Startup Cost for a Combined Cycle Generation Resource shall be determined by the positive transition cost from the On-Line Combined Cycle Generation Resource within the Combine Cycle Train or from a shutdown condition, whichever ERCOT determines to be appropriate.

(7) ERCOT may accept COPs only from QSEs.

(8) For the first 168 hours of the COP, ERCOT will update the HSL values for Wind-powered Generation Resources (WGRs) with the most recently updated Short-Term Wind Power Forecast (STWPF), and the HSL values for PhotoVoltaic Generation Resources (PVGRs) with the most recently updated Short-Term PhotoVoltaic Power Forecast (STPPF). ERCOT will notify the QSE via an Extensible Markup Language (XML) message each time COP HSL values are updated with the forecast values. A QSE representing a WGR may override the STWPF HSL value but must submit an HSL value that is less than or equal to the amount for that Resource from the most recent STWPF provided by ERCOT; a QSE representing a PVGR may override the STPPF HSL value but must submit an HSL value that is less than or equal to the amount for that Resource from the most recent STPPF provided by ERCOT.

|  |
| --- |
| ***[NPRR1029: Replace paragraph (8) above with the following upon system implementation:]***  (8) For the first 168 hours of the COP, ERCOT will update the HSL values for Wind-powered Generation Resources (WGRs) with the most recently updated Short-Term Wind Power Forecast (STWPF), and the HSL values for PhotoVoltaic Generation Resources (PVGRs) with the most recently updated Short-Term PhotoVoltaic Power Forecast (STPPF). A QSE representing a DC-Coupled Resource shall provide the capacity value of the Energy Storage System (ESS) that is included in the HSL of the DC-Coupled Resource, and ERCOT will update the DC-Coupled Resource’s HSL with the sum of the forecasts of the intermittent renewable generation component and the QSE-submitted value for the ESS component. ERCOT will notify the QSE via an Extensible Markup Language (XML) message each time COP HSL values are updated with the forecast values. A QSE representing a WGR may override the STWPF HSL value but must submit an HSL value that is less than or equal to the amount for that Resource from the most recent STWPF provided by ERCOT; a QSE representing a PVGR may override the STPPF HSL value but must submit an HSL value that is less than or equal to the amount for that Resource from the most recent STPPF provided by ERCOT. A QSE representing a DC-Coupled Resource may override the COP HSL value with a value that is lower than the ERCOT-populated value, and may override with a value that is higher than the ERCOT-populated value if the ESS component of the DC-Coupled Resource can support the higher value. |

(9) A QSE representing a Generation Resource that is not actively providing Ancillary Services or is providing Off-Line Non-Spin that the Resource will provide following the shutdown, may only use a Resource Status of SHUTDOWN to indicate to ERCOT through telemetry that the Resource is operating in a shutdown sequence or a Resource Status of ONTEST to indicate in the COP and through telemetry that the Generation Resource is performing a test of its operations either manually dispatched by the QSE or by ERCOT as part of the test. A QSE representing a Generation Resource that is not actively providing Ancillary Services may only use a Resource Status of STARTUP to indicate to ERCOT through telemetry that the Resource is operating in a start-up sequence requiring manual control and is not available for Dispatch.

(10) If a QSE has not submitted a valid COP for any Generation Resource for any hour in the DAM or RUC Study Period, then the Generation Resource is considered to have a Resource Status as OUT thus not available for DAM awards or RUC commitments for those hours.

(11) If a COP is not available for any Resource for any hour from the current hour to the start of the DAM period or RUC study, then the Resource Status for those hours are considered equal to the last known Resource Status from a previous hour’s COP or from telemetry as appropriate for that Resource.

(12) A QSE representing a Resource may only use the Resource Status code of EMR for a Resource whose operation would have impacts that cannot be monetized and reflected through the Resource’s Energy Offer Curve or recovered through the RUC make-whole process or if the Resource has been contracted by ERCOT under Section 3.14.1 or under paragraph (4) of Section 6.5.1.1. If ERCOT chooses to commit an Off-Line unit with EMR Resource Status that has been contracted by ERCOT under Section 3.14.1 or under paragraph (4) of Section 6.5.1.1, the QSE shall change its Resource Status to ONRUC. Otherwise, the QSE shall change its Resource Status to ONEMR.

(13) A QSE representing a Resource may use the Resource Status code of ONEMR for a Resource that is:

(a) On-Line, but for equipment problems it must be held at its current output level until repair and/or replacement of equipment can be accomplished; or

(b) A hydro unit.

(14) A QSE operating a Resource with a Resource Status code of ONEMR may set the HSL and LSL of the unit to be equal to ensure that SCED does not send Base Points that would move the unit.

(15) A QSE representing a Resource may use the Resource Status code of EMRSWGR only for an SWGR.

|  |
| --- |
| ***[NPRR1026: Insert paragraph (16) below upon system implementation:]***  (16) A QSE representing a Self-Limiting Facility must ensure that the sum of the COP HSL/LSL and the sum of the telemetered HSL/LSL submitted for each Resource within the Self-Limiting Facility do not exceed either the limit on MW Injection or the limit on the MW Withdrawal established for the Self-Limiting Facility. |

|  |
| --- |
| ***[NPRR1029: Insert paragraph (16) below upon system implementation:]***  (16) A QSE representing a DC-Coupled Resource shall not submit an HSL that exceeds the inverter rating or the sum of the nameplate ratings of the generation component(s) of the Resource. |

***6.4.7 QSE-Requested Decommitment of Resources and Changes to Ancillary Service Resource Responsibility of Resources***

(1) A Resource must remain committed during any Reliability Unit Commitment (RUC)-Committed Interval or RUC Buy-Back Hour unless the Resource has a Forced Outage.

(2) In the Operating Period, a QSE may request to decommit a Resource other than a Quick Start Generation Resource (QSGR) for any interval that is not a RUC-Committed Interval or RUC Buy-Back Hour by verbally requesting ERCOT to consider its request.

(3) In the Operating Period, a QSE may decommit a QSGR without any request for any interval that is neither a RUC-Committed Interval, a RUC Buy-Back Hour, nor an interval in which a manual override by the ERCOT Operator has been given.

(4) In the Adjustment Period, a QSE may request to decommit a Resource for any interval that is not a RUC-Committed Interval or RUC Buy-Back Hour by indicating a change in unit status in the QSE’s COP, unless the Resource received a Weekly Reliability Unit Commitment (WRUC) instruction for the hour. A QSE may request to decommit a Resource for any interval that is a WRUC-instructed Interval and that is not a RUC-Committed Interval or RUC Buy-Back Hour by verbally requesting ERCOT to consider its request.

(5) In the Adjustment Period, a QSE may request ERCOT approval for moving an Ancillary Service Resource Responsibility from one Resource to another like Resource by changing its COP. A QSE may transfer Ancillary Service Resource Responsibility for any Ancillary Service to any like Generation Resource telemetering an ONOPTOUT Resource Status. ERCOT shall use the Hourly Reliability Unit Commitment (HRUC) and other processes to study the move and if Ancillary Services become infeasible as a result of the proposed move, ERCOT shall follow the provisions of Section 6.4.9.1.2, Replacement of Infeasible Ancillary Service Due to Transmission Constraints. The phrase “like Resource” means that Ancillary Service Resource Responsibility moves may only be from a Generation Resource to a Generation Resource, from a Load Resource to a Load Resource, or from a Load Resource to a Generation Resource.

|  |
| --- |
| [NPRR1092: Replace paragraph (5) above with the following upon system implementation:]  (5) In the Adjustment Period, a QSE may request ERCOT approval for moving an Ancillary Service Resource Responsibility from one Resource to another like Resource by changing its COP. A QSE may transfer Ancillary Service Resource Responsibility for any Ancillary Service to any like Generation Resource that has successfully opted out of RUC Settlement. ERCOT shall use the Hourly Reliability Unit Commitment (HRUC) and other processes to study the move and if Ancillary Services become infeasible as a result of the proposed move, ERCOT shall follow the provisions of Section 6.4.9.1.2, Replacement of Infeasible Ancillary Service Due to Transmission Constraints. The phrase “like Resource” means that Ancillary Service Resource Responsibility moves may only be from a Generation Resource to a Generation Resource, from a Load Resource to a Load Resource, or from a Load Resource to a Generation Resource. |

(6) In the Operating Period, a QSE shall only provide an Ancillary Service from a Resource which was reported to ERCOT in the COP to be providing that Ancillary Service for the effective Operating Hour unless modified pursuant to paragraph (7) below.

(7) A QSE may vary the quantity of the Ancillary Service Resource Responsibility on Resources without obtaining prior ERCOT approval during the time window beginning 30 seconds prior to a five-minute clock interval and ending ten seconds prior to that five-minute clock interval, provided that the QSE complies with its total Ancillary Service Supply Responsibility.

|  |
| --- |
| ***[NPRR1010: Replace Section 6.4.7 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]***  ***6.4.7 QSE-Requested Decommitment of Resources***  (1) A Resource must remain committed during any Reliability Unit Commitment (RUC)-Committed Interval or RUC Buy-Back Hour unless the Resource has a Forced Outage.  (2) In the Operating Period, a QSE may request to decommit a Resource other than a Quick Start Generation Resource (QSGR) for any interval that is not a RUC-Committed Interval or RUC Buy-Back Hour by verbally requesting ERCOT to consider its request.  (3) In the Operating Period, a QSE may decommit a QSGR without any request for any interval that is neither a RUC-Committed Interval, a RUC Buy-Back Hour, nor an interval in which a manual override by the ERCOT Operator has been given.  (4) In the Adjustment Period, a QSE may request to decommit a Resource for any interval that is not a RUC-Committed Interval or RUC Buy-Back Hour by indicating a change in unit status in the QSE’s COP, unless the Resource received a Weekly Reliability Unit Commitment (WRUC) instruction for the hour. A QSE may request to decommit a Resource for any interval that is a WRUC-instructed Interval and that is not a RUC-Committed Interval or RUC Buy-Back Hour by verbally requesting ERCOT to consider its request. |

**6.5.5.1 Changes in Resource Status**

(1) Each QSE shall notify ERCOT of a change in Resource Status via telemetry and through changes in the Current Operating Plan (COP) as soon as practicable following the change.

(2) Each QSE shall promptly inform ERCOT when the operating mode of its Generation Resource’s Automatic Voltage Regulator (AVR) or Power System Stabilizer (PSS) is changed while the Resource is On-Line. The QSE shall also provide the Resource’s AVR or PSS status logs to ERCOT upon request.

(3) Each QSE shall immediately report to ERCOT and the TSP any inability of the QSE’s Generation Resource required to meet its reactive capability requirements in these Protocols.

(4) A QSE or Resource Entity may use a Generation Resource or Energy Storage Resource to serve Customer Load as part of a Private Microgrid Island (PMI) in any circumstance in which the Customer Load and the Resource are both disconnected from the ERCOT System due to an Outage of the transmission and/or distribution system, provided that the configuration complies with the requirements of paragraph (7) of Section 10.3.2.3, Generation Netting for ERCOT-Polled Settlement Meters, and provided that the QSE or Resource Entity has notified the TDSP of the establishment of a PMI configuration. The QSE shall ensure that the Load served by the Resource in the PMI configuration is de-energized at the time it is reconnected to the ERCOT System following the PMI configuration. All operations in a PMI configuration and any reconnection of Load following a PMI configuration shall be coordinated with the TDSP.

(5) A TDSP shall not intentionally disconnect, or direct another TDSP to disconnect, a Generation Resource or Energy Storage Resource included in a PMI configuration from the ERCOT System except in the following circumstances:

(a) An approved or accepted Planned or Maintenance Outage of a Transmission Facility reasonably requires, or would otherwise result in, the disconnection of the Resource from the ERCOT System;

(b) The Resource is a Distribution Generation Resource or Distribution Energy Storage Resource, and disconnection of the Resource is required for distribution system maintenance;

(c) The TDSP’s disconnection of the Resource is necessary to maintain the security of the TDSP’s system or the ERCOT System;

(d) The TDSP’s disconnection of the Resource is necessary to protect the public from a safety risk attributable to the operation of the Resource; or

(e) ERCOT directs the disconnection of the Resource.

***6.5.6 TSP and DSP Responsibilities***

(1) Each TSP shall notify ERCOT of any changes in status of Transmission Elements as provided in these Protocols and clarified in the ERCOT procedures.

(2) Each TSP shall as soon as practicable report to ERCOT any short-term inability to meet minimum TSP reactive requirements.

(3) Each DSP shall as soon as practicable report to ERCOT any short-term inability to meet minimum DSP reactive requirements.

|  |
| --- |
| [NPRR1098: Replace Section 6.5.6 above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross Transmission LLC (Southern Cross) provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a Transmission Service Provider (TSP) and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]  6.5.6 TSP, TO, DCTO, and DSP Responsibilities  (1) Each TSP shall notify ERCOT of any changes in status of Transmission Elements as provided in these Protocols and clarified in the ERCOT procedures.  (2) Each TSP shall as soon as practicable report to ERCOT any short-term inability to meet minimum TSP reactive requirements.  (3) Each DSP shall as soon as practicable report to ERCOT any short-term inability to meet minimum DSP reactive requirements.  (4) Each DCTO shall immediately notify its designated TO of any change that affects the reactive capability of any DC Tie Facility it operates, including any change to the operation mode of the DC Tie Facility’s voltage control system or any temporary transmission voltage limit changes. Each TO designated by a DCTO shall immediately notify ERCOT when a DC Tie Facility experiences a change that affects its reactive capability, including any change to the operation mode of the DC Tie Facility’s voltage control system or any temporary transmission voltage limit changes.  (5) Each TO designated by a DCTO operating a DC Tie meeting the applicability requirements of paragraph (1) of Section 3.15.4, Direct Current Tie Owner and Direct Current Tie Operator (DCTO) Responsibilities Related to Voltage Support, shall for each such DC Tie provide to ERCOT, via ICCP, the status of the DC Tie Facility’s voltage control system. An “On” status will indicate that the control system is on and set to regulate the voltage at the DC Tie’s POIB in automatic voltage control mode, and an “Off” status will indicate that the control system is off or in manual mode.  (6) Each TO designated by a DCTO operating a DC Tie meeting the applicability requirements of paragraph (1) of Section 3.15.4 shall telemeter to ERCOT, via ICCP, the Real-Time target voltage at each DC Tie’s POIB. Each TO shall modify the telemetered target voltage to match any verbal target voltage instruction issued as soon as practicable. |

***6.6.13 Wholesale Storage Load Reconciliation for ESRs Operating in a Private Microgrid Island***

(1) A QSE representing an Energy Storage Resource (ESR) operating in a Private Microgrid Island (PMI) configuration shall, within 96 hours of the end of such operations, submit a Settlement and billing dispute notifying ERCOT of the date and time that PMI operation began and ended.  The QSE shall also notify the interconnecting TDSP(s) of the time and date the PMI configuration began and ended within 96 hours of the end of such operations. Following the submission of such a dispute, ERCOT shall use the outflow quantities recorded by the ERCOT-Polled Settlement (EPS) Meter measuring the ESR’s gross output net of any internal telemetered auxiliary Load, combined with any telemetered integrated auxiliary Load to determine the amount of Load served by the Resource during the period of PMI operation. ERCOT shall then determine the minimum whole number of Operating Days including and successively preceding the beginning of PMI operation for which the cumulative amount of Wholesale Storage Load (WSL) consumed on those Operating Days would equal or exceed the amount of Load served by the Resource during the period of PMI operation. ERCOT shall grant the dispute and recharacterize all WSL previously settled on each such Operating Day as non-WSL. The adjustment to Settlements based on the recharacterization of WSL will be included in the RTM Final Settlement and/or RTM True-Up Settlement for each Operating Day.

**10.3.2.3 Generation Netting for ERCOT-Polled Settlement Meters**

(1) Generation Resources and netted Loads, including construction and maintenance Load that is netted with existing generation auxiliaries, must be metered at their POIs to the ERCOT Transmission Grid. Interval Data Recorders (IDRs) must be used to determine generator output or Load usage. In the intervals where the generation output exceeds the Load, the net must be settled as generation. In the intervals where the Load exceeds the generation output, the net must be settled as Load, and carry any applicable Load shared charges and credits.

|  |
| --- |
| ***[NPRR917: Replace paragraph (1) above with the following upon system implementation:]***  (1) Generation Resources or Settlement Only Generators (SOGs) and netted Loads, including construction and maintenance Load that is netted with existing generation auxiliaries, must be metered at their POIs to the ERCOT Transmission Grid or Service Delivery Point. Interval Data Recorders (IDRs) must be used to determine net generator output or Load usage. In the intervals where the generation output exceeds the Load, the net must be settled as generation. In the intervals where the Load exceeds the generation output, the net must be settled as Load and carry any applicable Load shared charges and credits. |

(2) For Settlement purposes, netting is not allowed except under the configurations described in paragraphs (2)(a) through (2)(d) below, and only if the service arrangement is otherwise lawful. ERCOT has no obligation to independently determine whether a site configuration that includes both Loads and Generation Resource(s) or SOGs complies with Public Utility Regulatory Act (PURA) or the Public Utility Commission of Texas (PUCT) Substantive Rules, and ERCOT’s approval of a metering proposal for such a site is not a verification of the legality of that arrangement:

(a) Single POI or Service Delivery Point with delivered and received metering data channels;

(b) Multiple POIs where the Loads and generator output are electrically connected to a common switchyard, as defined in paragraph (6) below. In addition, there must be sufficient generator capacity to serve all plant Loads for netting to occur;

(c) A Qualifying Facility (QF) with POIs, where the QF is selling energy to a thermal host, may net the Load meters of the thermal host with the QF’s generation meters when the Load and generation are electrically connected to a common switchyard. In instances in which Load is served by new on-site generation through a common switchyard, the TSP or DSP may install monitoring equipment necessary for measuring Load to determine stranded cost charges, if any are applicable, as determined under the PURA and applicable PUCT rules. For purposes of this Section, new on-site generation has the meaning as contained in Public Utility Regulatory Act, Tex. Util. Code Ann. §§ 39.252 and 39.262(k) (Vernon 1998 & Supp. 2007) (PURA); or

(d) For Generation Resources and/or Load with flow-through on a private, contiguous transmission system (not included in a TSP or DSP rate base) and in a configuration existing as of October 1, 2000, the meters at the interconnections with the ERCOT Transmission Grid may be netted for the purpose of determining Generation Resources or Load. For Settlement purposes, when the net is a Load, the metered interconnection points must be assigned to the same Load Zone and Unaccounted for Energy (UFE) zone.

(3) For Energy Storage Resource (ESR), Settlement Only Distribution Energy Storage System (SODESS), or Settlement Only Transmission Energy Storage System (SOTESS) sites, Wholesale Storage Load (WSL) must be separately metered from all other Loads and generation, and must be metered using EPS Metering Facilities.

(a) For configurations where the Resource Entity telemeters an auxiliary Load value to the EPS Meter:

(i) The total energy into the ESR, SODESS, or SOTESS must be separately metered from all other Loads and generation, and must be metered using EPS Metering Facilities; and

(ii) The auxiliary Load energy shall be stored in the EPS Meter’s IDR, per channel assignments defined in the SMOG.

(b) For configurations where the WSL is not at the POI, it must be metered behind a single POI metering point, per the requirements in paragraph (3) or (3)(a) above; and

(c) WSL for a compressed air energy storage Load Resource is exempt from the requirement to be electrically connected to a common switchyard, as defined in paragraph (6) below.

(4) ERCOT shall maintain descriptions of the Metering Facilities of all common switchyards that contain multiple POIs of Loads (ESI IDs) and generation meters (EPS). The description is limited to identifying the Entities within a common switchyard and a simplified diagram showing the metering configuration of all Supervisory Control and Data Acquisition (SCADA) and Settlement Metering points.

(5) All Load(s) included in the netting arrangement for an EPS Metering Facility shall only be electrically connected to the ERCOT Transmission Grid through the EPS metering point(s) for such Facility.  Such Loads shall not be electrically connected to the ERCOT Transmission Grid through electrical connections that are not metered by the EPS metering point(s) for the Facility.

(6) For purposes of this Section, a common switchyard is defined as an electric substation Facility where the POI for Load and Generation Resources are located at the same Facility but where the interconnection points are physically not greater than 400 yards apart. The physical connections of the Load to its POI and the Generation Resource to its POI cannot be Facilities that have been placed in a TSP’s or DSP’s rate base.

(7) Notwithstanding any other provision in this section, for any Generation Resource or ESR that is configured to serve a Customer Load as part of a Private Microgrid Island (PMI), the connection to the Customer Load in the PMI configuration shall be located behind the EPS metering point at the Resource’s POI. For a PMI configuration that includes an ESR that is receiving WSL treatment for charging Load, an EPS Meter shall be located to measure the ESR’s gross output net of any internal telemetered auxiliary Load, and a separate TDSP ESI ID (for nodal Settlement) with a Load Serving Entity (LSE) association must be established for the site prior to service of any Load.

|  |
| --- |
| ***[NPRR945: Insert paragraph (8) below upon system implementation:]***  (8) ERCOT shall post on the ERCOT website a report listing all Generation Resources or Settlement Only Generators (SOGs) that have achieved commercial operations, excluding Decommissioned Generation Resources, Mothballed Generation Resources, and decommissioned SOGs, whose Resource Registration data indicates that the Generation Resource or SOG is part of a Private Use Network. The report must identify the name of the Generation Resource or SOG site, its nameplate capacity, and the date the Generation Resource or SOG was added to the report. The report shall not identify any confidential, customer-specific information regarding netted loads. ERCOT shall update the list at least monthly. |