

# **ERCOT Load Profiling Guide**

**June 1, 2013**

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# **ERCOT Load Profiling Guide**

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**June 1, 2013**

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**ERCOT Load Profiling Guide**  
**Section 1: Introduction**

**October 1, 2010**

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## **1 INTRODUCTION**

### **1.1 Purpose of the Load Profiling Guide**

Load Profiling within the ERCOT market is the practice of estimating 15-minute interval Load for Customers who do not have devices that measure interval consumption. Load Profiling enables the participation of these Customers in the ERCOT market. This practice shall be conducted in a way that attempts to minimize the Load Profile's contribution to Unaccounted for Energy (UFE) by the Load Profile overall Settlement Intervals and that no unfair advantage is given to any Market Participant.

### **1.2 Document Purpose**

- (1) The purpose of the Electric Reliability Council of Texas (ERCOT) Load Profiling Guide (LPG) is to explicate the language and intent in the Protocols that affect Load Profiling. It is not a substitute for the ERCOT Protocols or the Public Utility Commission of Texas (PUC) Substantive Rules. Each Market Participant shall comply with the Protocols and the PUC Substantive Rules. In the event of a conflict of Protocols or PUC Substantive Rules, the Protocols and PUC Substantive Rules take precedence over the LPG.
- (2) This LPG may be updated monthly. The most recent version of this LPG is posted on the ERCOT website.

**ERCOT Load Profiling Guide**  
**Section 2: Load Profiling Guide Revision Process**

February 1, 2013

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## 2 LOAD PROFILING GUIDE REVISION PROCESS

### 2.1 Introduction

- (1) A request to make additions, edits, deletions, revisions, or clarifications to this Load Profiling Guide (LPG), including any attachments and exhibits to this LPG, is called a Load Profiling Guide Revision Request (LPGRR). Except as specifically provided in other sections of this LPG, this Section 2, Load Profiling Guide Revision Process, shall be followed for all LPGRRs. ERCOT Members, Market Participants, Public Utility Commission of Texas (PUCT) Staff, ERCOT, and any other Entities are required to utilize the process described herein prior to requesting, through the PUCT or other Governmental Authority, that ERCOT make a change to this LPG, except for good cause shown to the PUCT or other Governmental Authority.
- (2) The “next regularly scheduled meeting” of the Profiling Working Group (PWG), Commercial Operations Subcommittee (COPS), Technical Advisory Committee (TAC), or the ERCOT Board shall mean the next regularly scheduled meeting for which required Notice can be timely given regarding the item(s) to be addressed, as specified in the appropriate ERCOT Board or committee procedures.
- (3) Throughout the LPG, references are made to the ERCOT Protocols. ERCOT Protocols supersede the LPG and any LPGRRs must be compliant with the ERCOT Protocols. The ERCOT Protocols are subject to the revision process outlined in Protocol Section 21, Process for Nodal Protocol Revision.
- (4) ERCOT may make non-substantive corrections at any time during the processing of a particular LPGRR. Under certain circumstances, however, the LPG can also be revised by ERCOT rather than using the LPGRR process outlined in this Section.
  - (a) This type of revision is referred to as an “Administrative LPGRR” or “Administrative Changes” and shall consist of non-substantive corrections, such as typos (excluding grammatical changes), internal references (including table of contents), improper use of acronyms, references to ERCOT Protocols, PUCT Substantive Rules, the Public Utility Regulatory Act (PURA), North American Electric Reliability Corporation (NERC) regulations, Federal Energy Regulatory Commission (FERC) rules, etc., and revisions for the purpose of maintaining consistency between Section 2, Load Profiling Guide Revision Process, and Protocol Section 21, Revision Request Process.
  - (b) ERCOT shall post such Administrative LPGRRs on the ERCOT website and distribute the LPGRRs to the PWG at least ten Business Days before implementation. If no Entity submits comments to the Administrative LPGRR in accordance with paragraph (1) of Section 2.4.3, Profiling Working Group Review and Action, ERCOT shall implement it according

to paragraph (4) of Section 2.7, Revision Implementation. If any ERCOT Member, Market Participant, PUCT Staff, or ERCOT submits comments to the Administrative LPGRR, then it shall be processed in accordance with the LPGRR process outlined in this Section 2.

## **2.2 Submission of Load Profiling Guide Revision Request**

The following Entities may submit a Load Profiling Guide Revision Request (LPGRR):

- (a) Any Market Participant;
- (b) Any ERCOT Member;
- (c) Public Utility Commission of Texas (PUCT) Staff;
- (d) ERCOT; and
- (e) Any other Entity who resides (or represents residents) in Texas or operates in the Texas electricity market.

## **2.3 Profiling Working Group**

- (1) The Profiling Working Group (PWG) shall review and recommend action on formally submitted Load Profiling Guide Revision Requests (LPGRRs) provided that:
  - (a) PWG meetings are open to ERCOT, ERCOT Members, Market Participants, and the Public Utility Commission of Texas (PUCT) Staff; and
  - (b) Each Market Segment is allowed to participate.
- (2) Where additional expertise is needed, the PWG may request that the Commercial Operations Subcommittee (COPS) refer an LPGRR to existing Technical Advisory Committee (TAC) subcommittees, working groups or task forces for review and comment on the LPGRR. Suggested modifications or alternative modifications if a consensus recommendation is not achieved by a non-voting working group or task force, to the LPGRR should be submitted by the chair or the chair's designee on behalf of the commenting TAC subcommittee, working group or task force as comments on the LPGRR for consideration by the PWG. However, the PWG shall retain ultimate responsibility for the processing of all LPGRRs.
- (3) The PWG shall ensure that the Load Profiling Guide (LPG) is compliant with the ERCOT Protocols. As such, the PWG shall monitor all changes to the ERCOT Protocols and initiate any LPGRRs necessary to bring the LPG in conformance

with the ERCOT Protocols. The PWG shall also initiate a Nodal Protocol Revision Request (NPRR) if such a change is necessary to accommodate a proposed LPGRR prior to proceeding with that LPGRR.

- (4) ERCOT shall consult with the PWG chair to coordinate and establish the meeting schedule for the PWG. The PWG shall meet at least once per month, unless no LPGRRs were submitted during the prior 24 days, and shall ensure that reasonable advance notice of each meeting, including the meeting agenda, is posted on the ERCOT website.

## **2.4 Load Profiling Guide Revision Procedure**

### **2.4.1 Review and Posting of Load Profiling Guide Revision Requests**

- (1) Load Profiling Guide Revision Requests (LPGRRs) shall be submitted electronically to ERCOT by completing the designated form provided on the ERCOT website. ERCOT shall provide an electronic return receipt response to the submitter upon receipt of the LPGRR.
- (2) The LPGRR shall include the following information:
  - (a) Description of requested revision and reason for suggested change;
  - (b) Impacts and benefits of the suggested change on ERCOT market structure, ERCOT operations, and Market Participants to the extent that the submitter may know this information;
  - (c) Impact Analysis (applicable only for an LPGRR submitted by ERCOT);
  - (d) List of affected Load Profiling Guide (LPG) sections and subsections;
  - (e) General administrative information (organization, contact name, etc.); and
  - (f) Suggested language for requested revision.
- (3) ERCOT shall evaluate the LPGRR for completeness and shall notify the submitter within five Business Days of receipt if the LPGRR is incomplete, then ERCOT shall include the reasons for such status. ERCOT may provide information to the submitter that will correct the LPGRR and render it complete. An incomplete LPGRR shall not receive further consideration until it is completed. In order to pursue the LPGRR, a submitter must submit a completed version of the LPGRR.
- (4) If a submitted LPGRR is complete or once an LPGRR is completed, ERCOT shall post the LPGRR on the ERCOT website and distribute to the Profiling Working Group (PWG) within three Business Days.

### **2.4.2      *Withdrawal of a Load Profiling Guide Revision Request***

- (1) A submitter may withdraw or request to withdraw an LPGRR by submitting a completed Request for Withdrawal form provided on the ERCOT website. ERCOT shall post the submitter's Request for Withdrawal on the ERCOT website within three Business Days of submittal.
- (2) The submitter of an LPGRR may withdraw the LPGRR at any time before the PWG recommends approval of the LPGRR. If the PWG has recommended approval of the LPGRR, the Request for Withdrawal must be approved by the Commercial Operations Subcommittee (COPS) if the LPGRR has not yet been recommended for approval by COPS.
- (3) If COPS has recommended approval of the LPGRR, the Request for Withdrawal must be approved by the Technical Advisory Committee (TAC) if the LPGRR has not yet been approved by TAC.
- (4) If TAC has recommended approval of an LPGRR that requires an ERCOT project for implementation, the Request for Withdrawal must be approved by the ERCOT Board if the LPGRR has not yet been approved by the ERCOT Board.
- (5) Once an LPGRR that requires an ERCOT project for implementation is approved by the ERCOT Board or an LPGRR that does not require an ERCOT project for implementation is approved by TAC, such LPGRR cannot be withdrawn.

### **2.4.3      *Profiling Working Group Review and Action***

- (1) Any ERCOT Member, Market Participant, Public Utility Commission of Texas (PUCT) Staff or ERCOT may comment on the LPGRR.
- (2) To receive consideration, comments must be delivered electronically to ERCOT in the designated format provided on the ERCOT website within 14 days from the posting date of the LPGRR. Comments submitted after the 14 day comment period may be considered at the discretion of the PWG after these comments have been posted. Comments submitted in accordance with the instructions on the ERCOT website, regardless of date of submission, shall be posted on the ERCOT website and distributed electronically to the PWG within three Business Days of submittal.
- (3) The PWG shall consider the LPGRR at its next regularly scheduled meeting after the end of the 14 day comment period. At such meeting, the PWG may take action on the LPGRR. In considering action on an LPGRR, the PWG may:
  - (a) Recommend approval of the LPGRR as submitted or as modified;
  - (b) Recommend rejection of the LPGRR;

- (c) If no consensus can be reached on the LPGRR, present options for COPS consideration;
  - (d) Defer decision on the LPGRR; or
  - (e) Recommend that COPS refer the LPGRR to a subcommittee, working group, or task force as provided in Section 2.3, Profiling Working Group.
- (4) Within three Business Days after the PWG takes action, ERCOT shall issue a PWG Report reflecting the PWG action and post it on the ERCOT website. The PWG Report shall contain the following items:
- (a) Identification of submitter;
  - (b) LPG language recommended by the PWG, if applicable;
  - (c) Identification of authorship of comments, if applicable;
  - (d) Proposed effective date of the LPGRR;
  - (e) Recommended priority and rank for any LPGRRs requiring an ERCOT project for implementation; and
  - (f) PWG action.

#### ***2.4.4 Comments to the Profiling Working Group Recommendation Report***

- (1) Any ERCOT Member, Market Participant, PUCT Staff, or ERCOT may comment on the PWG Report. Within three Business Days of receipt of comments related to the PWG Report, ERCOT shall post such comments on the ERCOT website. Comments submitted in accordance with the instructions on the ERCOT website, regardless of date of submission, shall be posted on the ERCOT website within three Business Days of submittal..
- (2) The comments on the PWG Report will be considered at the next regularly scheduled PWG or COPS meeting where the LPGRR is being considered.

#### ***2.4.5 Load Profiling Guide Revision Request Impact Analysis***

- (1) ERCOT shall submit to the PWG an initial Impact Analysis based on the original language in the LPGRR with any ERCOT-sponsored LPGRR. The initial Impact Analysis will provide the PWG with guidance as to what ERCOT computer systems, operations, or business functions could be affected by the LPGRR as submitted.
- (2) If PWG recommends approval of an LPGRR, ERCOT shall prepare an Impact Analysis based on the proposed language in the PWG Report. If ERCOT has



- already prepared an Impact Analysis, ERCOT shall update the existing Impact Analysis, if necessary, to accommodate the language recommended for approval in the PWG Report.
- (3) The Impact Analysis shall assess the impact of the LPGRR on ERCOT computer systems, operations, or business functions and shall contain the following information:
    - (a) An estimate of any cost and budgetary impacts to ERCOT for both implementation and ongoing operations;
    - (b) The estimated amount of time required to implement the LPGRR;
    - (c) The identification of alternatives to the LPGRR that may result in more efficient implementation; and
    - (d) The identification of any manual workarounds that may be used as an interim solution and estimated costs of the workaround.
  - (4) Unless a longer review period is warranted due to the complexity of the proposed PWG Report, ERCOT shall issue an Impact Analysis for an LPGRR for which PWG has recommended approval of prior to the next regularly scheduled PWG meeting. ERCOT shall post the results of the completed Impact Analysis on the ERCOT website. If a longer review period is required by ERCOT to complete an Impact Analysis, ERCOT shall submit comments with a schedule for completion of the Impact Analysis to the PWG.

#### **2.4.6 Profiling Working Group Review of Impact Analysis**

- (1) After ERCOT posts the results of the Impact Analysis, the PWG shall review the Impact Analysis at its next regularly scheduled meeting. The PWG may revise its PWG Report after considering the information included in the Impact Analysis or additional comments received on the PWG Report.
- (2) After consideration of the Impact Analysis and the PWG Report, ERCOT shall issue a revised PWG Report and post it on the ERCOT website within three Business Days of the PWG consideration of the Impact Analysis and PWG Report. If the PWG revises the proposed LPGRR, ERCOT shall update the Impact Analysis, if necessary and issue the updated Impact Analysis to COPS. If a longer review period is required for ERCOT to update the Impact Analysis, ERCOT shall submit comments with a schedule for completion of the Impact Analysis to COPS.
- (3) If the LPGRR requires an ERCOT project for implementation, at the same meeting the PWG shall assign a recommended priority and rank for the associated project.

### 2.4.7 *Commercial Operations Subcommittee Vote*

- (1) COPS shall consider any LPGRRs that the PWG has submitted to COPS for consideration for which both a PWG Report and an Impact Analysis (as updated if modified by the PWG under Section 2.4.6, Profiling Working Group Review of Impact Analysis) have been posted on the ERCOT website. The following information must be included for each LPGRR considered by COPS:
  - (a) The PWG Report and Impact Analysis; and
  - (b) Any comments received in timely manner in response to the PWG Report.
- (2) The quorum and voting requirements for COPS action are set forth in the Technical Advisory Committee Procedures. In considering action on a PWG Report, COPS shall:
  - (a) Recommend approval of the LPGRR as recommended in the PWG Report or as modified by COPS;
  - (b) Reject the LPGRR;
  - (c) Defer decision on the LPGRR;
  - (d) Remand the LPGRR to the PWG with instructions; or
  - (e) Refer the LPGRR to another COPS working group or task force or another TAC subcommittee with instructions.
- (3) If a motion is made to recommend approval of an LPGRR and that motion fails, the LPGRR shall be deemed rejected by COPS unless at the same meeting COPS later votes to recommend approval of, defer, remand, or refer the LPGRR. If a motion to recommend approval of an LPGRR fails via e-mail vote according to the Technical Advisory Committee Procedures, the LPGRR shall be deemed rejected by COPS unless at the next regularly scheduled COPS meeting or in a subsequent e-mail vote prior to such meeting, COPS votes to recommend approval of, defer, remand, or refer the LPGRR. The rejected LPGRR shall be subject to appeal pursuant to Section 2.5, Appeal of Action.
- (4) Within three Business Days after COPS takes action on the LPGRR, ERCOT shall issue a COPS Report reflecting the COPS action, and post the report on the ERCOT website. The COPS Report shall contain the following items:
  - (a) Identification of the submitter of the LPGRR;
  - (b) Modified LPG language proposed by COPS, if applicable;
  - (c) Identification of the authorship of comments, if applicable;

- (d) Proposed effective date(s) of the LPGRR;
- (e) Recommended priority and rank for any LPGRR requiring a an ERCOT project for implementation;
- (f) PWG action; and
- (g) COPS action.

#### **2.4.8 *ERCOT Impact Analysis Based on Commercial Operations Subcommittee Report***

ERCOT shall review the COPS Report and, if necessary, update the Impact Analysis as soon as practicable. ERCOT shall issue the updated Impact Analysis, if applicable, to TAC and post it on the ERCOT website. If a longer review period is required for ERCOT to update the Impact Analysis, ERCOT shall submit comments with a schedule for completion of the Impact Analysis to TAC.

#### **2.4.9 *Protocol Revision Subcommittee Review of Project Prioritization***

At the next regularly scheduled Protocol Revision Subcommittee (PRS) meeting after COPS recommends approval of an LPGRR that requires an ERCOT project for implementation, the PRS shall assign a recommended priority and rank for the associated project.

#### **2.4.10 *Technical Advisory Committee Vote***

- (1) TAC shall consider any LPGRR that COPS has submitted to TAC for consideration for which both a COPS Report and an Impact Analysis (as updated if modified by COPS under Section 2.4.8, ERCOT Impact Analysis Based on Commercial Operations Subcommittee Report) have been posted on the ERCOT website. The following information must be included for each LPGRR considered by TAC:
  - (a) The COPS Report and Impact Analysis;
  - (b) The recommended priority and rank, if an ERCOT project is required; and
  - (c) Any comments timely received in response to the COPS Report.
- (2) The quorum and voting requirements for TAC action are set forth in the Technical Advisory Committee Procedures. In considering action on a COPS Report, TAC shall:

- (a) Approve the LPGRR as recommended in the COPS Report or as modified by TAC, if the LPGRR does not require an ERCOT project for implementation;
  - (b) Recommend approval of the LPGRR as recommended in the COPS Report or as modified by TAC, including modification of the recommended priority and rank if the LPGRR requires an ERCOT project for implementation;
  - (c) Reject the LPGRR;
  - (d) Defer decision on the LPGRR;
  - (e) Remand the LPGRR to COPS with instructions; or
  - (f) Refer the LPGRR to another TAC subcommittee or a TAC working group or task force with instructions.
- (3) If a motion is made to approve or recommend approval of an LPGRR and that motion fails, the LPGRR shall be deemed rejected by TAC unless at the same meeting TAC later votes to approve, recommend approval of, defer, remand or refer the LPGRR. If a motion to approve or recommend approval of an LPGRR fails via e-mail vote according to the Technical Advisory Committee Procedures, the LPGRR shall be deemed rejected by TAC unless at the next regularly scheduled TAC meeting or in a subsequent e-mail vote prior to the such meeting, TAC votes to approve, recommend approval of, defer, remand, or refer the LPGRR. The rejected LPGRR shall be subject to appeal pursuant to Section 2.5, Appeal of Action.
- (4) Within three Business Days after TAC takes action on an LPGRR, ERCOT shall issue a TAC Report reflecting the TAC action and post it on the ERCOT website. The TAC Report shall contain the following items:
- (a) Identification of the submitter of the LPGRR;
  - (b) Modified LPG language proposed by TAC, if applicable;
  - (c) Identification of the authorship of comments, if applicable;
  - (d) Proposed effective date(s) of the LPGRR;
  - (e) Priority and rank for any LPGRR requiring an ERCOT project for implementation;
  - (f) COPS action;
  - (g) TAC action; and

- (h) ERCOT's position for any LPGRR requiring an ERCOT project for implementation.
- (5) If TAC recommends approval of an LPGRR requiring an ERCOT project for implementation, ERCOT shall forward the TAC Report, to the ERCOT Board for consideration pursuant to Section 2.4.11, ERCOT Board Vote.
- (6) The TAC chair shall report the results of all votes by TAC related to LPGRRs to the ERCOT Board at its next regularly scheduled meeting.

#### **2.4.11 ERCOT Board Vote**

- (1) For any LPGRR requiring an ERCOT project for implementation, upon issuance of a TAC Report and Impact Analysis to the ERCOT Board, the ERCOT Board shall review the TAC Report and the Impact Analysis at the following month's regularly scheduled meeting. For Urgent LPGRRs, the ERCOT Board shall review the TAC Report and Impact Analysis at the next regularly scheduled meeting, unless a special meeting is required due to the urgency of the LPGRR.
- (2) The quorum and voting requirements for ERCOT Board action are set forth in the ERCOT Bylaws. In considering action on a TAC Report, the ERCOT Board shall:
  - (a) Approve the LPGRR as recommended in the TAC Report or as modified by the ERCOT Board;
  - (b) Reject the LPGRR;
  - (c) Defer decision on the LPGRR; or
  - (d) Remand the LPGRR to TAC with instructions.
- (3) If a motion is made to approve an LPGRR and that motion fails, the LPGRR shall be deemed rejected by the ERCOT Board unless at the same meeting the ERCOT Board later votes to approve, defer or remand the LPGRR. The rejected LPGRR shall be subject to appeal pursuant to Section 2.5, Appeal of Action.
- (4) Within three Business Days after the ERCOT Board takes action on an LPGRR, ERCOT shall issue a Board Report reflecting the ERCOT Board action and post it on the ERCOT website.

#### **2.5 Appeal of Action**

- (1) Any ERCOT Member, Market Participant, Public Utility Commission of Texas (PUC) Staff, or ERCOT may appeal a Profiling Working Group (PWG) action to recommend rejection of, defer, or recommend referral of a Load Profiling

- Guide Revision Request (LPGRR) directly to the Commercial Operations Subcommittee (COPS). Such appeal to COPS must be submitted electronically to ERCOT by completing the designated form provided on the ERCOT website within ten Business Days after the date of the relevant PWG appealable event. ERCOT shall reject appeals made after that time. ERCOT shall post appeals on the ERCOT website within three Business Days of receiving the appeal. If the appeal is submitted to ERCOT at least 11 days before the next regularly scheduled COPS meeting, ERCOT shall place the appeal on the agenda of the next regularly scheduled COPS meeting. If the appeal is submitted to ERCOT less than 11 days before the next regularly scheduled COPS meeting, COPS will hear the appeal at the next subsequent regularly scheduled COPS meeting. An appeal of an LPGRR to COPS suspends consideration of the LPGRR until the appeal has been decided by COPS.
- (2) Any ERCOT Member, Market Participant, PUCT Staff, or ERCOT may appeal a COPS action to reject, defer, remand or refer an LPGRR directly to the Technical Advisory Committee (TAC). Such appeal to TAC must be submitted electronically to ERCOT by completing the designated form provided on the ERCOT website within ten Business Days after the date of the relevant COPS appealable event. ERCOT shall reject appeals made after that time. ERCOT shall post appeals on the ERCOT website within three Business Days of receiving the appeal. If the appeal is submitted to ERCOT at least 11 days before the next regularly scheduled TAC meeting, ERCOT shall place the appeal on the agenda of the next regularly scheduled TAC meeting. If the appeal is submitted to ERCOT less than 11 days before the next regularly scheduled TAC meeting, TAC will hear the appeal at the next subsequent regularly scheduled TAC meeting. An appeal of an LPGRR to TAC suspends consideration of the LPGRR until the appeal has been decided by TAC.
- (3) Any ERCOT Member, Market Participant, PUCT Staff, or ERCOT may appeal a TAC action to approve, reject, defer, remand or refer an LPGRR directly to the ERCOT Board. Appeals to the ERCOT Board shall be processed in accordance with the ERCOT Board Policies and Procedures. An appeal of an LPGRR to the ERCOT Board suspends consideration of the LPGRR until the appeal has been decided by the ERCOT Board.
- (4) Any ERCOT Member, Market Participant, or PUCT Staff, may appeal any decision of the ERCOT Board regarding the LPGRR to the PUCT or other Governmental Authority. Such appeal to the PUCT or other Governmental Authority must be made within any deadline prescribed by the PUCT or other Governmental Authority, but in any event no later than 35 days of the date of the relevant ERCOT Board appealable event. Notice of any appeal to the PUCT or other Governmental Authority must be provided, at the time of the appeal to ERCOT's General Counsel. If the PUCT or other Governmental Authority rules on the LPGRR, ERCOT shall post the ruling on the ERCOT website.

## 2.6 Urgent Requests

- (1) The party submitting a Load Profiling Guide Revision Request (LPGR) may request that the LPGR be considered on an urgent timeline (“Urgent”) only when the submitter can reasonably show that an existing Load Profiling Guide (LPG) provision is impairing or could imminently impair wholesale or retail market operations, or is causing or could imminently cause a discrepancy between a Settlement formula and a provision of the ERCOT Protocols.
- (2) The Commercial Operations Subcommittee (COPS) may designate the LPGR for Urgent consideration if a submitter requests Urgent status or upon valid motion in a regularly scheduled meeting of COPS. Criteria for designating an LPGR as Urgent are that the LPGR requires immediate attention due to:
  - (a) Serious concerns about ERCOT System reliability or market operations under the unmodified language; or
  - (b) The crucial nature of Settlement activity conducted pursuant to any Settlement formula.
- (3) ERCOT shall prepare an Impact Analysis for Urgent LPGRs as soon as practicable.
- (4) COPS or the Profiling Working Group (PWG) shall consider the Urgent LPGR and Impact Analysis if available at the next regularly scheduled PWG or COPS meeting, or at a special meeting called by the PWG or COPS chair to consider the Urgent LPGR.
- (5) If the submitter desires to further expedite processing of the LPGR, a request for voting via e-mail may be submitted to the COPS chair. The COPS chair may grant the request for voting via e-mail. Such voting shall be conducted pursuant to the Technical Advisory Committee Procedures. If COPS recommends approval of the Urgent LPGR, ERCOT shall issue a COPS Report to reflecting the COPS action and post it on the ERCOT website within three Business Days after COPS takes action. The Technical Advisory Committee (TAC) chair may request action from TAC to accelerate or alter the procedures described herein, as needed, to address the urgency of the situation.
- (6) Any LPGRs that take effect pursuant to an Urgent request shall be subject to an Impact Analysis pursuant to Section 2.4.8, ERCOT Impact Analysis Based on Commercial Operations Subcommittee Report, and TAC consideration pursuant to Section 2.4.10, Technical Advisory Committee Vote.

## 2.7 Revision Implementation

- (1) For Load Profiling Guide Revision Requests (LPGRs) that do not require an ERCOT project for implementation, upon Technical Advisory Committee (TAC)

- approval, ERCOT shall implement LPGRRs on the first day of the month following TAC approval, unless otherwise provided in the TAC Report for the approved LPGRR.
- (2) For LPGRRs that require an ERCOT project for implementation, upon ERCOT Board approval ERCOT shall implement LPGRRs on the first day of the month following the ERCOT Board approval, unless otherwise provided in the Board Report for the approved LPGRR.
  - (3) For LPGRRs for which an effective date other than the first day of the month following, TAC or ERCOT Board approval, as applicable, is provided, the ERCOT Impact Analysis shall provide an estimated implementation date and ERCOT shall provide notice as soon as practicable, but no later than ten days prior to actual implementation, unless a different notice period is required in the TAC or Board Report, as applicable, for the approved LPGRR.
  - (4) ERCOT shall implement an Administrative LPGRR on the first day of the month following the end of the ten Business Day posting requirement outlined in Section 2.1, Introduction.



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**3 [ RESERVED]**

**ERCOT Load Profiling Guide**  
**Section 4: The Profiling Working Group**

**October 1, 2010**

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## **4 THE PROFILING WORKING GROUP**

The Profiling Working Group (PWG) is a standing informal, open working group that provides technical support to the Commercial Operations Subcommittee (COPS) on Load Profiling issues.

### **4.1 Purpose of the Profiling Working Group**

The Profiling Working Group (PWG) is a forum in which Market Participants may participate to facilitate changes in the market rules pertaining to Load Profiling issues as reflected in the Protocols and the Load Profiling Guide (LPG). The PWG shall be involved in all policy issues and some operational aspects of Load Profiling in the ERCOT market.

### **4.2 Profiling Working Group Responsibilities**

The PWG has several responsibilities and duties, which include the following:

- (a) Maintains and upholds Protocol Section 18, Load Profiling;
- (b) Reviews all requests for changes to Load Profiles, Load Profiling Methodologies, and implementation of the Load Profiling process;
- (c) Reviews and makes recommendations to the Commercial Operations Subcommittee (COPS) regarding the Load Profiling Guide (LPG) change control, Load Profile Models, and Load Profile Methodologies;
- (d) Reviews and makes recommendations to Appendix D, Profile Decision Tree;
- (e) Participates in defining Weather Zones and Load Profile types;
- (f) Evaluates the validation and assignment processes for Load Profile IDs;
- (g) Evaluates the impact of the Interval Data Recorder (IDR) requirement for possible revision prior to retail metering;
- (h) Periodically reviews the selected profiling technique for Time-Of-Use (TOU);
- (i) Coordinates with ERCOT in developing Load Profiles for particular Customer segments that may require special Load Profiling techniques (e.g., supplemental Load Profiles);
- (j) Develops and maintains the LPG;

- (k) Reviews and makes recommendations to the ERCOT Load Profiling Department on Load Research Sample Design;
- (l) Performs a liaison function between Market Participants and the ERCOT Load Profiling Department and facilitates market acceptance of Load Profiling processes; and
- (m) Provides a forum for Market Participants to be involved with ERCOT Load Profiling.

### **4.3 Profiling Working Group Reporting Structure**

- (1) At the time of the development of the Load Profiling Guide (LPG), the Profiling Working Group (PWG) reported to the Commercial Operations Subcommittee (COPS), which is a standing subcommittee of Technical Advisory Committee (TAC). The PWG chair and the PWG vice-chair are elected annually by the PWG on a calendar year basis. The chair leads the PWG meeting, establishes the PWG meeting dates and frequency, and represents the PWG at COPS and other ERCOT forums, as necessary. The vice-chair's primary responsibilities are to perform the chair's duties in the absence of the chair. The PWG shall continue to meet at least quarterly to review profiling processes and profiling issues.
- (2) To obtain current reporting structure information, please refer to the following website: <http://www.ercot.com/committees/index.html>.

### **4.4 Profiling Working Group Membership**

The Profiling Working Group (PWG) membership is open to all Market Participants and any other interested parties (e.g., consultants, Non-Opt-In Entities (NOIEs), future Market Participants, and Public Utility Commission of Texas (PUCT) Staff). All Market Participants are invited to attend all PWG meetings.

### **4.5 Profiling Working Group Contact Information**

- (1) To begin receiving electronic mail related to the Profiling Working Group (PWG), subscribe to the PWG electronic mailing list at <http://lists.ercot.com/>.
- (2) To discontinue receiving electronic mail related to the PWG, unsubscribe from the PWG electronic mailing list at <http://lists.ercot.com/>.
- (3) The ERCOT Load Profiling Department may also assist with contact information.

**ERCOT Load Profiling Guide**  
**Section 5: Guidelines for Load Profile Development**

October 1, 2010



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## 5 GUIDELINES FOR LOAD PROFILE DEVELOPMENT

This Section specifies guidelines that shall be used in the development of Load Profiles used in the ERCOT market.

### 5.1 Background

- (1) The Profiling Working Group (PWG) established high-level principles to be utilized in the development of Load Profiles. These principles are specified in Protocol Section 18.2.1, Guidelines for Development of Load Profiles.
- (2) A few minor wording changes were incorporated into the approved version to properly reflect current Load Profiling responsibilities of ERCOT and current terminology used in the ERCOT market.

### 5.2 Guidelines

The following guidelines were used by ERCOT for the development of Load Profiles and should be considered in Load Profile development.

- (a) To minimize the total number of Load Profiles to be used in the market, ERCOT shall review the existing Load research data available for each geographical or climatological area and analyze opportunities for using one Load Profile to represent more than one class Load shape.
- (b) A basic economic model shall be developed to enable ERCOT to analyze existing Load data, together with representative generation price data, so as to provide ERCOT with information on the appropriate number of Load Profiles to adopt for the ERCOT market. In particular, this would allow the following questions to be addressed:
  - (i) To what extent do the existing Load Profiles represent homogeneous groups with respect to Load shape and supply costs?; and
  - (ii) To what extent do the existing Load shapes for similar Customer groups (e.g., Residential) show distinct differences from each other, especially during periods of high generation cost volatility?
- (c) The assignment of Load Profiles to areas that do not currently have Load research data available shall be based on the following issues:
  - (i) What separate Customer groups are currently recognized for the area requiring a Load Profile (e.g., rate classes)?;

- (ii) What Load shapes are available from other areas for each of these Customer groups?;
  - (iii) Where possible, examine broad measures of similarity between the Customer group(s) for which Load research data that is available and the Customer group requiring a Load Profile. These measures might include:
    - (A) Average kWh consumption per year or month from billing records;
    - (B) For Customer groups with Demand metering, the annual average Load factor; and
    - (C) Other specific data that may be available for the Customer group requiring a Load Profile (e.g., where the type of electrical use is considered to be similar to that of another area with a similar usage pattern).
  - (iv) The geographic proximity of the areas for which Load research data is available.
- (d) In adopting Load Profiles for those areas where Load research data already exists and in assigning Load Profiles to those areas that do not currently have Load research data, there shall be readily identifiable parameters, for each Customer, to enable Load Profile IDs to be assigned to each Customer. Ideally, the Customer parameters that determine which Load Profile that Customer is assigned shall be based upon existing data. Some examples of readily identifiable parameters are:
- (i) Type of Customer (residential, small commercial, large commercial, etc.);
  - (ii) Peak Demand; and
  - (iii) Load factor.
- Other parameters, such as those relating to geographic location, shall be unambiguous and straightforward.
- (e) Where alternative Load research data exist, the most accurate data shall be used. This accuracy shall be based on Load research data on all Customers from all distribution utilities in that region. Generally, the most recent data is preferred but other factors such as the sample size and Customer coverage shall be considered.
  - (f) To accommodate Time Of Use (TOU) pricing, controlled Load and other similar pricing schemes, ERCOT shall consider the following possibilities:

- (i) Where specific Load research data exists for a particular group, utilize that data;
  - (ii) When appropriate, generic Load Profiles may be modified to approximate the consumption patterns of multiple pricing periods; and
  - (iii) Where specific Load research data does not exist for a particular group, appropriate Load Profiles could be used from other areas, based on the relevant guideline above.
- (g) Load Profiles shall be clearly expressed and readily available. A standard form to represent all Load Profiles is desirable for consistency and ease of understanding.
- (h) The methodology used to create Load Profiles shall be fully defined. Any mathematical or statistical equations used shall be unambiguously defined.

**ERCOT Load Profiling Guide**  
**Section 6: Load Profiling Methodology**

**December 1, 2010**

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## **6 LOAD PROFILING METHODOLOGY**

### **6.1 Introduction**

- (1) This Section 6, Load Profiling Methodology, of the Load Profiling Guide (LPG) describes the periodic evaluation of the Load Profiling Methodologies as specified in Protocol Section 18.2.8, Adjustments and Changes to Load Profile Development.
- (2) The procedure to request a change to Load Profiling Methodologies is presented in Section 7, Request for Changes to Load Profiling Methodology.
- (3) There shall be no retroactive application of any approved modifications to Load Profiling Methodology.

### **6.2 Review of Load Profiling Methodology**

ERCOT shall review Load Profiling Methodologies periodically. When special circumstances warrant, a more immediate review may be necessary. The findings of all Load Profiling Methodology reviews shall be presented to the Profiling Working Group (PWG) for consideration.

### **6.3 Considerations for Load Profiling Methodology Evaluation**

The evaluation shall consider the following factors, which is neither an exclusive nor an exhaustive list:

- (a) Load Profile Model performance;
- (b) Methodology performance;
- (c) Alternative methodology impacts to Load Profiling issues; and
- (d) Practical implementation of Load Profiling Methodology.

#### **6.3.1 *Load Profile Model Performance***

Model performance serves as a basis for evaluating Load Profiling Methodology. The result of Load Profile Model performance evaluations shall help determine if a methodology modification is necessary. Load Profile Model performance shall be evaluated according to Section 8, Load Profile Models.

### **6.3.2      *Methodology Performance***

The performance of alternative Load Profiling Methodologies shall be assessed according to the evaluation criteria presented in Section 8, Load Profile Models.

### **6.3.3      *Alternative Methodology Impacts to Load Profiling Issues***

The effect of the proposed alternative methodology on Load Profiling issues requiring resolution shall be considered when evaluating the methodology. Alternative Load Profiling Methodologies may mitigate, intensify or have no effect on these issues. These effects shall be assessed for probability and manageability. Some effects of the alternative methodology may include the following:

- (a) Unusual events that affect the ERCOT System;
- (b) Dramatic changes in a relatively short period of time;
- (c) Sensitivity of the methodology to random error;
- (d) Changes to data quality; and
- (e) Impacts to the cost.

### **6.3.4      *Practical Implementation of Load Profiling Methodology***

The practical implementation of a Load Profiling Methodology is a key-determining factor. The time and the resources needed to implement the change may make the proposed methodology prohibitive. Additional issues that may be considered are:

- (a) Alternative changes (e.g., changes to models), which may provide the Market Participants the desired result; and
- (b) The complexity of implementation and operational production (e.g., system functionality) for ERCOT and Market Participants.

## **6.4      *Possible Results of the Evaluation of Methodologies***

The following are possible resolutions of requests to change Load Profiling Methodologies:

- (a) No changes to Load Profiling Methodologies;
- (b) Modify existing Load Profiling Methodology; and
- (c) Implement alternative Load Profiling Methodology.



**6.4.1      *No Changes to Load Profiling Methodologies***

The evaluation of the methodology may conclude that no changes are needed. Another outcome of the evaluation may indicate that adjustments to model coefficients are needed for specified segments and/or Weather Zones. Either case shall be resolved by not altering the current Load Profiling Methodology.

**6.4.2      *Modify Existing Load Profiling Methodology***

During any annual evaluation, significant biases may be exposed which require major changes such as re-estimating models, changing Weather Zones, or changing segments. In such cases, modifying the existing Load Profiling Methodology may be employed as a practical resolution. The Profiling Working Group (PWG) shall determine “significant biases” with market experience.

**6.4.3      *Implement Alternative Load Profiling Methodology***

If the evaluation indicates that substantial biases exist, and that these biases are unlikely to be mitigated or are likely to be increased by reasonable modifications to the existing methodology, a more comprehensive change to an alternative Load Profiling Methodology shall be considered. The likely effects on these biases and other processing issues shall be determining factors in the decision to adopt a new methodology.

**ERCOT Load Profiling Guide**  
**Section 7: Request for Changes to Load Profiling**  
**Methodology**

**December 1, 2010**

**7 REQUEST FOR CHANGES TO LOAD PROFILING METHODOLOGY ..... 7-1**

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## 7 REQUEST FOR CHANGES TO LOAD PROFILING METHODOLOGY

- (1) This Section 7, Request for Changes to Load Profiling Methodology, of the Load Profiling Guide (LPG) addresses changes and modifications to the methodology used to establish Load Profiles. Any changes to the Load Profiling Methodology shall be submitted as a Load Profiling Revision Request (LPGRR) as described in Section 2.4, Load Profiling Guide Revision Procedure.
- (2) There shall be no retroactive application of any approved modifications to Load Profiling Methodology.

### 7.1 Current Methodologies

The following methodologies are used to establish Load Profiles:

Type of Load	Load Profiling Methodology
<b><i>Non-Price-Responsive</i></b>	
Non-interval metered	Adjusted Static Models
Non-interval metered with Distributed Generation (DG)	Adjusted Static Models and Engineering Estimates
Non-metered	Engineering Estimates
Interval Data Recorder (IDR) (Estimation)	Proxy day
<b><i>Price-Responsive</i></b>	
Time Of Use (TOU)	Chunking
Other price-responsive	To be determined

### 7.2 Request for Load Profiling Methodology Changes

Any Market Participant, the Profiling Working Group (PWG) or its designated successor, or ERCOT may submit a request for a change to the Load Profiling Methodology according to the procedures outlined in the Load Profiling Guide (LPG).

### 7.3 Timeline for Processing a Load Profiling Methodology Change Request

- (1) This Section 7.3, Timeline for Processing a Load Profiling Methodology Change Request, modifies the normal Load Profiling Guide Revision Request (LPGRR) change request timeline. Within two Business Days of receiving the request, ERCOT shall reply to the submitter indicating that the request has been received and inform the submitter of the dates of the next Profiling Working Group (PWG) meetings. The submitter shall then schedule a time to present the request, in person, to the PWG and ERCOT at a regularly scheduled PWG meeting.

- (2) The submitter or a designated representative shall present the methodology change request, in person, to the PWG at a scheduled PWG meeting. During the submitter's presentation, ERCOT and the PWG may ask for clarification of the request. The PWG and ERCOT shall then determine what data and supporting documentation are needed from the submitter to evaluate the request. All data, supporting files, and documentation shall be provided in electronic form.
- (3) After the request has been presented to the PWG, ERCOT shall post the methodology request to the ERCOT website and respond to the request within 60 days of the posted date of the request. This period does not include the time to analyze and render the complete assessment of the request. The response shall indicate:
  - (a) Whether the request is complete;
  - (b) What additional data is required to evaluate the request, if applicable;
  - (c) How the request shall be assessed;
  - (d) An estimate of the time by which a decision on the request is expected to be ready; and
  - (e) An estimate of the implementation date of the requested change, if approved.
- (4) During ERCOT's evaluation of the request, ERCOT may request supplemental information determined to be important to fully evaluate the methodology change.
- (5) Due to the significance of a change to Load Profiling Methodologies, according to Protocol Section 18.2.8, Adjustments and Changes to Load Profile Development, a change shall only be implemented after Technical Advisory Committee (TAC) approval and with at least 150 days' notice to all Market Participants. An exception may be made to the criteria defined in this section, if special circumstances indicate a need to implement a change more immediately to address critical market issues.

#### **7.4 Information Required with Request for Change**

- (1) The submitter shall describe the reason why a change to methodology is necessary, why the proposed methodology is superior to the current methodology, and how the benefits of the change outweigh the costs to implement the proposed methodology.
- (2) The submitter shall identify the following:
  - (a) The Entity submitting the request;

- (b) Contact information;
  - (c) The current methodology to be modified;
  - (d) The proposed methodology or modification(s) proposed to the current methodology; and
  - (e) The affected Load Profile Segment(s) and Weather Zone(s).
- (3) The submitter shall include pertinent supporting data with the initial request to ERCOT. Examples include the following:
- (a) Analysis of data available in ERCOT systems (e.g., Load research data, weather data from weather stations used by ERCOT Load Profiling, and monthly consumption data). The submitter shall document data sources in detail and show analysis of any factors listed above to be considered in the evaluation.
  - (b) Analysis of Load research data not available to ERCOT. The submitter shall document data sources in detail, describe how the data was collected, document any data Validation, Editing, and Estimating (VEE) that has been performed, and describe the analysis.
  - (c) Analysis of other data or other supporting evidence. The submitter shall document data sources and present the associated analysis.
- (4) The submitter shall also provide evidence that:
- (a) The current profiles have substantial bias;
  - (b) The proposed alternative mitigates the problem(s);
  - (c) The change in methodology is warranted due to the severity of the problem(s) with the current profiles; and/or
  - (d) The proposed alternative methodology corrects the problem(s) with the current profiles efficiently and cost-effectively.

## **7.5 Evaluation of the Request**

ERCOT shall assess the request based on the data and analysis submitted with the request as well as possible additional analysis by ERCOT. Factors considered in assessing any request shall include:

- (a) The quality of the supporting data provided;
- (b) The magnitude of differences indicated;

- (c) The size of the affected population; and
- (d) The effect on the rest of the market if the change is accepted.

### **7.6 Approval of the Request**

The Technical Advisory Committee (TAC) approval is required to implement any change to a Load Profiling Methodology in accordance with Protocol Section 18.2, Methodology. The request shall follow the approval sequence described in Section 12, Request for Load Profile Segment Changes, Additions, or Removals.

### **7.7 Costs for Load Profiling Methodology Changes**

- (1) The party requesting the methodology change shall pay all costs associated with developing the supporting data and documentation submitted to ERCOT for evaluation.
- (2) In the event the methodology change is approved, costs for implementing the changes in ERCOT data systems shall be the responsibility of ERCOT. Responsibility for re-assigning Load Profiles remains with the Transmission and/or Distribution Service Provider (TDSP).

**ERCOT Load Profiling Guide  
Section 8: Load Profile Models**

**December 1, 2010**



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## 8 LOAD PROFILE MODELS

- (1) Protocol Section 18.2.8 Adjustments and Changes to Load Profile Development, requires ongoing evaluation of Load Profiling Methodology that provides for changes to methodology, adjustments to existing profiles, and development of new profiles. This Section addresses changes to models within approved methodologies. This Section also includes guidelines for ERCOT's ongoing evaluation of Load Profile Segment definitions and Weather Zones. Changes to Adjusted Static Models and changes to engineering profiles are also addressed.
- (2) The Microsoft Excel© representation of the ERCOT Load Profile Models can be found in Appendix E, Load Profile Model Spreadsheets.
- (3) There shall be no retroactive application of any approved modifications to Load Profile Models.
- (4) This Section discusses changes to Load Profile Models not addressed in the following the Load Profiling Guide (LPG) sections:
  - (a) Section 7, Request for Changes to Load Profiling Methodology;
  - (b) Section 12, Request for Load Profile Segment Changes, Additions, or Removals; and
  - (c) Section 13, Changes to Weather Zone Definitions.

### 8.1 Routine and Non-Routine Load Profile Model Evaluations

ERCOT shall perform evaluations of Load Profile Model performance, which shall include both routine and non-routine evaluations.

#### 8.1.1 *Routine Evaluation of Load Profile Model Performance*

ERCOT shall conduct a routine annual evaluation of Load Profile Model performance for all Load Profile Models, Load Profile Types, and Weather Zones. The evaluation shall address both Adjusted Static Models and Engineering Estimates. Based on this evaluation, ERCOT shall make recommendations to the Profiling Working Group (PWG).

#### 8.1.2 *Non-Routine Evaluation of Model Performance*

- (1) Between the annual evaluations, ERCOT may evaluate specific requests for changes to Load Profile Segment definitions and requests for changes to Weather Zones. Procedures for requesting such changes and evaluating the requests are described in Section 12, Request for Load Profile Segment Changes, Additions, or Removals, for Load Profile Segments, and in Section 13, Changes to Weather Zone Definitions, for Weather Zones.

- (2) Apart from evaluating change requests as described, ERCOT may also evaluate model performance if an urgent problem is identified. Such non-routine evaluation may be conducted in response to a request from a Market Participant, Technical Advisory Committee (TAC) subcommittee, or at ERCOT's initiative.

## 8.2 Evaluation of Load Profile Models Using Current Load Research Data

### 8.2.1 Sources of Load Research Data

- (1) Load research data may be obtained from ERCOT developed Load research samples and from any available Transmission and/or Distribution Service Provider (TDSP) Load research samples. Transfer of data from TDSPs to ERCOT and development of Load research samples by ERCOT are described in Section 15, Load Research Samples.
- (2) In certain circumstances, Load research data from other sources may also be considered by ERCOT as a representation of a particular subgroup. For such data to be used, the party submitting the data for use in an evaluation shall provide information on the source of the data. Submission requirements are the same as those described in Section 12.6, Information Required with Request for Change.

### 8.2.2 Procedures

The overall procedure for comparing existing Load Profile Models against current Load research data consists of the following:

- (a) Assignment to Load Profile Segments - Assign each sample site in the current Load research sample to the appropriate Load Profile Segment and Weather Zone. The expansion weight for each sampled site shall be determined using sound statistical practice.
- (b) Expansion - For each Load Profile Type and Weather Zone combination, use the appropriate expansion methodology and weight to expand the sample data assigned to the segment and Weather Zone. The results of the expansion Load Profiles are expressed as average Load per Customer for each interval.
- (c) Comparison - For each Load Profile Type and Weather Zone combination, compare the Load Profile estimates developed from the Load research sample data to the Load Profile estimates from the Load Profile Models. The Load Profile Models are applied to weather data for the same Weather Zone and time period as the Load research sample data. Factors to consider in the comparisons are discussed in Section 6.3, Consideration for Load Profiling Methodology Evaluation.

### **8.2.3**      *Using Comparable Weather Zone Data*

If the current Load research data represent only a portion of a particular Weather Zone, the modeled Load Profile shall be calculated to correspond to approximately the same mix of weather conditions as are represented by the current Load research data. That is, the weather data used to calculate the modeled Load Profile should be weighted to reflect the distribution of the current Load research data over weather stations within the zone, rather than using the existing weather data weighting for the current Load Profile Models.

### **8.2.4**      *Factors Considered in Comparisons*

In all the factors below, the Load Profile based on the current Load research data is treated as the proposed Load Profiles and the Load Profile based on the current model is treated as the existing Load Profiles. Referring to Appendix C, Measuring Differences Between Load Profiles, provides a more detailed description and the application of these factors. Note: In Appendix C, proposed Load Profiles are referred to as “Target Profiles” and existing Load Profiles are referred to as the “Default Profiles.”

#### **8.2.4.1**      **Load-Weighted Average Price**

Load-weighted average annual price is calculated using the Load Profile based on the new Load research data, and using the Load Profile based on the current model. The difference in Load-weighted annual price between the proposed and existing is one measure of the difference between the two Load Profiles.

#### **8.2.4.2**      **On-Peak/Off-Peak Ratio**

The ratio of on-peak to off-peak consumption is calculated using the Load Profile based on the new Load research data and using the modeled Load Profile. The ratio for the existing Load Profile is subtracted from the ratio for the proposed Load Profile.

#### **8.2.4.3**      **Load Factor**

The Load factor is calculated for the proposed Load Profile and for the existing Load Profile. The existing Load Profile’s Load factor is subtracted from that of the proposed Load Profile.

#### **8.2.4.4**      **Summary Statistics on Differences Between Series**

- (1) Several types of series characteristics may be calculated for each Load Profile. Several summary statistics may be used to describe the magnitude of the differences between series. These series and summary measures of differences

are described in Appendix C, Measuring Differences Between Load Profiles. The series include:

- (a) Unitized Load;
  - (b) Monthly fractions;
  - (c) Daily fractions; and
  - (d) Clock-hour fractions.
- (2) Each of these series may be calculated for the Load Profile based on new Load research data and for the Load Profile based on the current model.
- (3) The difference between the proposed and existing series is then measured in terms of one of the following summary statistics:
- (a) Mean difference;
  - (b) Mean absolute percent error;
  - (c) Mean absolute deviation; or
  - (d) Root mean square error.

#### **8.2.4.5 Deadweight Loss**

- (1) In the terminology used in Appendix C, Measuring Differences Between Load Profiles, the Load Profile representing the proposed segment is the “Target Profile.”
- (2) Deadweight loss measures the loss of economic efficiency due to providing Customers with Load Profiles that are less accurate, on average, than the Target Profile, with respect to the Electric Service Identifier (ESI ID) “actual” Load shapes. This loss is a societal cost, measured in dollars per year. Revising the current Load Profile to bring it closer to the Target Profile would reduce societal deadweight loss by at most this amount.

### **8.3 Evaluating Load Profile Models without Current Load Research Data**

#### **8.3.1 Applications**

- (1) In many situations, current Load research data are not available as a basis for assessing the adequacy of Load Profile Models. In these cases, other assessment techniques are used. Situations where techniques are required that do not depend on Load research data include:

- (a) Assessing model performance for geographic areas where Load research data are no longer collected;
  - (b) Assessing model performance for geographic areas where Load research data have never been collected, or have not contributed to current models; and
  - (c) Assessing Engineering Estimates.
- (2) These techniques may also be used as another way of assessing model performance even for geographic areas where current Load research data are available.

### **8.3.2 Load Profile Model Comparisons**

#### **8.3.2.1 Comparisons for Adjusted Static Models**

- (1) Adjusted Static Models may be assessed based on differences between the population the existing model is based on (the original population) and the population to which that model is applied (the current population). The original population is the population represented by the original Load research data, defined in terms of the Customers represented and the years of the data. For example, the original population might be “all Residential Customers from TDSP A from 1994 to 1996 plus all residential Customers from TDSP B in 1998.” The population to which the model is applied is the full set of Customers currently in the Load Profile Segment.
- (2) Differences between the original and current populations may be assessed in terms of factors such as those described under “other kinds of supporting data” in Section 12, Request for Load Profile Segment Changes, Additions, or Removals.

#### **8.3.2.2 Examination of Monthly Patterns**

- (1) Monthly consumption data are available to ERCOT for Settlement purposes. To compare consumption patterns with the Load Profile, the following steps may be used for each segment or subgroup under study:
  - (a) Sum the consumption data for each Electric Service Identifier (ESI ID) in the period under study (normally 12 monthly reads) to produce annual consumption totals for that ESI ID;
  - (b) Calculate the reading fraction for each of the ESI ID’s readings by dividing the monthly reading by the annual consumption total;

- (c) Compute the comparable reading fraction for the Load Profile of the segment or subgroup under study;
  - (d) Compare the reading fractions from item (1)(b) above with the reading fractions from item (1)(c) above for all ESI IDs in the segment or subgroup, using any of the statistics for differences of series described in Appendix C, Measuring Differences Between Load Profiles.
- (2) For each segment or subgroup, these comparisons may be made separately for each Weather Zone. The modeled Load Profile for each Weather Zone uses the model coefficients and weather data of that Weather Zone. The consumption data compared are for the ESI IDs assigned to that Weather Zone. Alternatively, an aggregate segment Load Profile may be compared to consumption data aggregated across Weather Zones. Procedures for calculating an aggregate segment Load Profile across Weather Zones are described in Section 8.2.2, Procedures.

### 8.3.2.3 Comparisons for Engineering Estimates

- (1) Engineering Estimates are used in the ERCOT market for Non-Metered Loads, such as lighting, and for metered Loads, such as those with Distributed Generation (DG). Engineering Estimates are typically based on an assumed operating schedule together with the assumption that the Load is approximately the same whenever the equipment is operating. If better or more current information is available for the ESI IDs in a Load Profile Segment using an engineering Load Profile, this information may be compared with the assumptions of the estimate.
- (2) Monthly consumption data may also be compared with the Load Profile monthly patterns using the methods described above for Adjusted Static Models.

## 8.4 Routine Load Profile Model Evaluations

- (1) Routine annual evaluation of model performance may include the following components using the procedures described in Section 8.2, Evaluation of Adjusted Static Load Profile Models Using Current Load Research Data and Section 8.3, Evaluating Load Profile Models without Current Load Research Data.
  - (a) For each adjusted static Load Profile Type and Weather Zone combination where current Load research samples exist, compare the Load Profile based on current Load research samples with the Load Profile based on the current model.
  - (b) For each adjusted static Load Profile Type, consider whether any current data are available that would indicate substantial changes in end-use saturation between current populations and those used to fit the models.

- (c) For each engineering Load Profile Type, consider whether any current data are available that would indicate substantial differences from those assumed in the engineering models.
    - (i) Possible sources of data on operating schedules and equipment saturations include:
      - (A) Regional data on equipment and operating hours from end-use consumption surveys published by the Energy Information Administration;
      - (B) Regional or state data on operating practices published by the Census Bureau;
      - (C) Economic data published by state or local agencies; and
      - (D) Saturation or other studies by Market Participants, if available.
    - (ii) Exhaustive review of such sources is not expected each year. However, ERCOT should periodically review what information may be available and consider the likelihood that practices have changed substantially in the region since the Load Profile Models were last updated. In reporting on the evaluation, ERCOT shall indicate what sources were reviewed and/or the basis that major changes were not likely to have occurred was determined.
  - (d) Review the magnitude of Load migrated into and out of each Load Profiling segment since the time the Load research data were collected.
  - (e) For each adjusted static Load Profile Type and Weather Zone combination, compare the patterns in current aggregate monthly consumption data with the monthly pattern of the current Load Profile Model.
- (2) If Unaccounted for Energy (UFE) is calculated by Weather Zone or other geographic subdivision, examine systematic patterns in UFE by day-type and hour for each such zone or region.

#### **8.4.1 Routine Evaluation of Weather Zones**

Assessment of Weather Zone definitions, conducted as part of the routine evaluation, shall focus on the adequacy of the current set of weather stations and weighting. ERCOT uses National Oceanic and Atmospheric Administration (NOAA) first or second order weather stations as the source for weather data for each Weather Zone, where available. Assessment steps of the evaluation of each Weather Zone shall be determined as the market matures. Steps may include the following:



- (a) Calculate each current segment Load Profile using each Weather Zone's model coefficients together with the current weighted average weather data for the Weather Zone;
- (b) Calculate weather station segment Load Profiles. Apply each Load Profile Segment model to weather data from each weather station, using the model coefficients for the Weather Zone that includes that weather station;
- (c) Assign each Zone Improvement Plan (ZIP) code to the closest weather station;
- (d) For each weather station and adjusted static segment, calculate the total annual energy for Electric Service Identifiers (ESI IDs) in ZIP codes assigned to the station;
- (e) Multiply each weather station segment Load Profile by the annual consumption from item (d) above;
- (f) Sum the results of item (e) above over all weather stations within each Weather Zone;
- (g) Translate the results from item (f) above into hourly fractions;
- (h) For each Weather Zone and segment, compare the summed Load Profile from item (f) above with the current Load Profile Model from item (a) above, using the methods described in Appendix C, Measuring Differences Between Load Profiles.
- (i) For each Weather Zone and segment, compare each weather station segment Load Profile from item (b) above with the current Load Profile Model from item (a) above, using the methods described in Appendix C, Measuring Differences Between Load Profiles.

## **8.5 Non-Routine Load Profile Model Evaluations**

Non-routine evaluations may consider any of the factors described in Section 8.4, Routine Evaluations, with attention limited to those segments and regions that are of concern. Non-routine evaluations to assess a request for a change in Load Profile Segment shall consider the factors described in Section 12, Request for Load Profile Segment Changes, Additions, or Removals. Non-routine evaluations to assess a request for a change in Weather Zone shall consider the factors described in Section 13, Changes to Weather Zone Definitions.

## 8.6 Assessing the Type of Load Profile Model Change Needed

### 8.6.1 Possible Changes

- (1) Based on the necessary changes that occur as a result of a routine or non-routine evaluation, ERCOT may recommend any of the following actions:
  - (a) Adjust coefficients or change Engineering Estimate assumptions for one or more Load Profile Segments;
  - (b) Re-estimate models for an Adjusted Static Model;
  - (c) Begin to collect new Load research data. When this data is available, use the new data to adjust coefficients or to re-estimate models for one or more Adjusted Static Models;
  - (d) Implement changes to particular Weather Zones;
  - (e) Implement changes to particular segments; and
  - (f) No change at this time.
- (2) Procedures for assessing the need for a change to Load Profile Segment definitions are discussed in Section 12, Request for Load Profile Segment Changes, Additions, or Removals. Procedures for assessing the need for changes to Weather Zones are discussed in Section 13, Changes to Weather Zone Definitions.

### 8.6.2 Qualitative Criteria

The subsections below provide a qualitative description of the basis on which the recommended change shall be determined. The qualitative assessment may utilize the listed criteria below, but is not limited to these criteria to address the severity of bias. These criteria are expressed in terms of set of conditions and the resulting change(s) of these conditions. Quantitative criteria, specifying explicit thresholds that shall trigger changes, may be determined with market experience.

#### 8.6.2.1 Substantial Bias

A key question in the determination of recommended action is whether the evaluation indicates a serious bias for one or more Load Profile Models. A serious bias is a systematic difference between Load Profiles based on the current models and Load Profiles based on current Load research data, with the difference large enough to materially affect Settlement accuracy. A potential for serious bias might also be

indicated by systematic differences in the factors described in Section 8.3, Evaluating Load Profile Models without Current Load Research Data.

#### **8.6.2.2 No Substantial Bias Indicated by Evaluation**

If the evaluation indicates no substantial bias, no change shall be recommended.

#### **8.6.2.3 Substantial Bias Indicated by Analysis of Current Load Research Data**

If the analysis of current Load research data indicates substantial bias for one or more Load Profile Segments, the recommended action shall depend on the scope of the bias problem.

##### **8.6.2.3.1 Modest Scope**

The bias would be considered modest in scope if it affects only limited Weather Zones, or would be corrected by moderate adjustments to model coefficients or Engineering Estimates. In some of these cases, the problems might be corrected by modifying Weather Zone definitions or weather station weights. These possibilities would be explored as part of the evaluation. In other cases, the recommended change may be to establish adjustment factors to apply to the modeled profiles for those segments in those Weather Zones.

##### **8.6.2.3.2 Extensive Scope**

The bias would be considered extensive in scope if bias is found for a particular profile segment across many Weather Zones, or the adjustment factors that would be required are substantial. In such cases, the recommendation shall be to re-estimate the model for the segment.

##### **8.6.2.3.3 Adjustment Factors**

- (1) If adjustment factors are developed, the types of adjustment factors computed and the means of computation would depend on the nature of the bias indicated by the analysis.
- (2) For example, if the analysis indicates large differences between the modeled profile and current Load research in daily fractions but not in clock-hour fractions, adjustments might be calculated as a function of day or day-type, not varying by clock-hour. If the differences found appear to be calendar effects but not strongly related to weather, adjustments might be developed by day-type and clock-hour, but not varying with weather variables.
- (3) If the differences appear to be related not only to calendar and clock-hour, but also to weather adjustment factors may be developed that include some weather terms. These would take the form of a supplemental model. If weather-dependent adjustments are needed, model re-estimation may be considered.

- (4) The revised profile  $\text{RevProf}_{szdh}$  for day  $d$  for Load Profile Segment  $s$  in Weather Zone  $z$  is calculated from the Load Profile Model together with the adjustment factor as:

$$\text{RevProf}_{szdh} = \text{Prof}_{szdh} \text{Adj}_{szdh}$$

Where:

$\text{Prof}_{szdh}$  is the unadjusted modeled profile for segment  $s$  in Weather Zone  $z$  on day  $d$  at hour  $h$ .

$\text{Adj}_{szdh}$  is the adjustment factor for profile segment  $s$  in Weather Zone  $z$  for day  $d$  at hour  $h$ .

- (5) For adjustments that are designed to address allocation across days but not across hours within days, the adjustment factor would not vary by hour. For adjustments that are based on calendar but not weather, the adjustment factor would vary by day-type but not by individual day.
- (6) All adjustments should be made to the current model in ERCOT's production system.

#### **8.6.2.4 Substantial Bias Indicated without Current Load Research Data**

If current Load research data are not available, identification of poor model performance is less obvious. Recommendations shall take into account not only how severe the bias appears to be, but also how certain it is that there is a bias and how likely the proposed changes shall substantially reduce the problem. Some possible situations and recommendations are outlined in the following subsections.

##### **8.6.2.4.1 *Similar Bias across Several Load Profile Segments within a Weather Zone***

Bias may be found to exist in similar directions across many adjusted static Load Profiles. If this bias appears to be related to one or more Weather Zone definitions, and may be reduced to an acceptable level by changing these definitions, a recommendation may be made to modify the definitions of the affected Weather Zone(s).

##### **8.6.2.4.2 *Bias Not Resolved by Modifying Weather Zones***

- (1) If there is substantial bias that does not appear to be related to Weather Zone definitions, and Load research data are not available as a basis for correcting the bias, a recommendation may be made to implement a Load research program to develop new data.

- (2) Given the significant cost of implementing new Load research data collection, and the uncertainty of actual Load Profile differences in absence of current Load research data, a recommendation to make such a change would require more severe bias than would a recommendation to adjust coefficients or re-estimate models. The severity of the bias would be considered in terms of the magnitude of the effect on Settlement. This magnitude would be assessed both in terms of the effect per Customer or per kWh and in terms of the amount of Load or number of Customers affected.
- (3) Prior to implementing a full-scale Load research sample for the affected segment(s) and Weather Zone(s), ERCOT may deploy a pilot sample for a limited period of time to obtain better information on the magnitude of the bias. This information would also be used to develop a more efficient full-scale Sample Design.

### **8.7 Criteria for Requiring a Load Profile Model Change**

- (1) As discussed in Section 8.1, Routine and Non-Routine Load Profile Model Evaluations, ERCOT is responsible for evaluating existing Load Profiles for change as Load Profiles may become stagnant and/or not representative of the segments of the ERCOT market for which they are used.
- (2) This Section details the criteria which should be applied in determining whether Load Profile changes are appropriate.
- (3) The following criteria shall be applied to determine whether Load Profile changes are appropriate based on evaluations using current Load research data:
  - (a) The Load weighted average annual price for a current Load Profile is outside the 90% confidence interval of the price estimate based on the Load Profile developed from the current Load research;
  - (b) The on-peak/off-peak ratio for a current Load Profile is outside the 90% confidence interval of the ratio estimate based on the Load Profile developed from the current Load research;
  - (c) The Load factor for a current Load Profile is outside the 90% confidence interval of the Load factor estimate based on the Load Profile developed from the current Load research;
  - (d) One or more of the comparison statistics listed in Section 8.2.4.4, Summary Statistics on Differences Between Series, for a current Load Profile are outside the 90% confidence interval of the corresponding statistic based on the Load Profile developed from the current Load research for 10% or more of the intervals for the analysis period, which is normally one year;

- (e) One or more of the summary statistics listed in Section 8.2.4.4 for a current Load Profile are outside the 90% confidence interval of the corresponding statistic based on the Load Profile developed from the current Load research.
- (4) The following criteria shall be applied to determine whether Load Profile changes are appropriate based on evaluations using other than current Load research data: The average difference of the reading fractions calculated as outlined in Section 8.3.2.2, Examination of Monthly Patterns, across the ESI IDs currently assigned to the Load Profile exceed 2% on either a seasonal or annual basis.

## **8.8 Procedures for Requesting a Change to Load Profile Models**

This Section 8.8, Procedures for Requesting a Change to Load Profile Models, describes the procedures for requesting changes to Load Profile Models. Procedures for requesting changes to Load Profile Segments are described in Section 12, Request for Load Profile Segment Changes, Additions, or Removals. Procedures for requesting changes to Weather Zones are described in Section 13, Changes to Weather Zone Definitions.

### **8.8.1 Request for Load Profile Model Changes**

- (1) The following Entities may submit requests for Load Profile Model changes:
- (a) Any Market Participant;
  - (b) Any Entity that is an ERCOT Member;
  - (c) Public Utility Commission of Texas (PUCT) Staff;
  - (d) ERCOT Staff; and
  - (e) Any other Entity who resides (or represent residents) in Texas or operates in the Texas electricity market.
- (2) Requests for Load Profile Model changes shall be submitted to the Profiling Working Group (PWG) and are subject to approval as outlined in Section 8.9.1, Timeline Prior to Implementing a Load Profile Change.

### **8.8.2 General Information Required with a Request**

- (1) Requests for changes shall include the following:
- (a) Identifying the party making the request, with contact information;
  - (b) Identifying the Load Profile Segment(s) and Weather Zone(s) affected; and

- (c) If requesting a non-routine evaluation, describe why the evaluation is needed more immediately than the next routine evaluation.
- (2) Parties may also submit requests for changes with supporting evidence to be considered as part of the next routine evaluation. Such requests should be identified as providing supporting information to be considered in the routine evaluation.

### **8.8.3 Requesting Load Profile Model Adjustment Factors**

- (1) To support a request for development or revision of adjustment factors, the following types of information may be submitted:
- (a) Analysis of data available in ERCOT systems. Such data may include recent Load research data collected by Transmission and/or Distribution Service Providers (TDSPs) or by ERCOT, weather data from weather stations used by ERCOT, or monthly consumption data. The supporting documents shall describe the data sources and show analysis of any factors such as those described in Section 8.4, Routine Evaluations.
  - (b) Analysis of Load research data not available to ERCOT. The supporting documents shall detail the data sources and show analysis of any factors such as those described in Section 8.4.
- (2) The quality of the data should be documented as described in Section 12, Request for Load Profile Segment Changes, Additions, or Removals.

### **8.8.4 Requesting Change to Engineering Estimates**

The supporting documentation shall provide evidence for changing the assumed operating schedules. The sources and quality of the data should be documented as described in Section 12.6, Information Required with Request for Change.

### **8.8.5 Requesting Re-Estimation of Models**

Supporting documentation shall provide data and analysis similar to that described in Section 7.4, Information Required with Request for Change. The documentation shall also offer evidence that the problems are widespread or are too severe to be corrected adequately by adjustments to coefficients.

## **8.9 Approval Process for Load Profile Model Changes**

- (1) If the Profiling Working Group (PWG) recommends a change based on the results of an evaluation, the following procedures shall be utilized to implement the change.
- (2) Recommendation by the PWG and the appropriate Technical Advisory Committee (TAC) subcommittee and approval by TAC, of any Load Profile Model changes are required before such changes are implemented.
- (3) Each recommendation for a Load Profile Model change shall be accompanied by an implementation plan to mitigate the impact of transitioning between old and new Load Profile Models. The implementation plan shall be approved by TAC.

### **8.9.1 *Timeline Prior to Implementing a Load Profile Change***

Refer to Protocol Section 18.2.8, Adjustments and Changes to Load Profile Development, for details of the implementation timeline.

### **8.9.2 *Adjusted Static Models***

#### **8.9.2.1 Development of Adjustment Factors**

- (1) As discussed in Section 8.6, Assessing the Type of Load Profile Model Change Needed, bias of moderate scope may be addressed by developing adjustment factors to the model coefficients for a particular segment and Weather Zone. Adjustment factors are calculated for each day-type and hour within each Weather Zone that shall be adjusted.
- (2) The calculated adjustment factors are then applied as an additional step in the calculation of the Load Profile for that segment and Weather Zone. That is, the new or revised Load Profile is calculated from the existing Weather Zone coefficients and current weather data as described in Section 8.6, Assessing the Type of Change Needed.
- (3) For Weather Zones that do not have adjustment factors, this step may be omitted from the Load Profile calculation process. Alternatively, adjustment factors may be included for all Weather Zones and/or for all segments within each Weather Zone, but these factors would be set to one for cases where no adjustment was to be made to that segment and Weather Zone.



### **8.9.2.2 Model Re-Estimation**

If the evaluation indicates a need to re-estimate the model parameters for a particular segment, the model coefficients shall be re-estimated across all Weather Zones. In the simplest case, the same model as currently used would be re-estimated using the most recent available Load research data. At the time the models are re-estimated, refinements to the model may also be considered.

### **8.9.3 *Engineering Estimates***

If the evaluation indicates a need to change the assumptions of the Engineering Estimates for this type of Load Profile Methodology, the revised assumptions shall be used to determine a new engineering-based Load Profile.

**ERCOT Load Profiling Guide**  
**Section 9: Load Profile IDs**

February 1, 2013

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## 9 LOAD PROFILE IDS

### 9.1 Assignment of Load Profile IDs

Transmission and/or Distribution Service Providers (TDSPs) are responsible for initially assigning the Load Profile IDs of all Electric Service Identifiers (ESI IDs), as well as any changes in assignment. ERCOT is responsible for calculating the Load Profile Segment for the Load Profile ID as defined by the Annual Validation process in Section 11.2, Annual Validation of Load Profile Type. The Profile Decision Tree is a dynamic Microsoft Office Excel© file (*see* Appendix D) that contains the directions to use when assigning Load Profile IDs to ESI IDs.

#### 9.1.1 *Profile Decision Tree Revision and Approval Process*

- (1) All revisions to the Profile Decision Tree shall be submitted through the Load Profiling Guide Revision Request (LPGRR) process described in Section 2, Load Profiling Guide Revision Process. ERCOT may use an administrative LPGRR to revise the contents of the following Profile Decision Tree tabs:
  - (a) FAQ – frequently asked questions related to the assignment of Load Profile IDs;
  - (b) Use of Components – information about how each component of the Load Profile ID is used by ERCOT in the Settlement process;
  - (c) ZipToZone – a table that maps Zone Improvement Plan (ZIP) Codes to Weather Zones;
  - (d) TOU Schedules – a list of the Time of Use Schedules (TOUSs) and their corresponding TOUS codes;
  - (e) Valid Profile IDs – a list of all Load Profile IDs that can be assigned to ESI IDs that are within the ERCOT region;
  - (f) Non-ERCOT Profile IDs – a list of Load Profile IDs that can be assigned to ESI IDs that are within Texas, but outside of the ERCOT region; and
  - (g) NOIEs – directions for Non-Opt-In Entities (NOIEs) to use in determining Load Profile ID assignments.

#### 9.1.2 *Assignment of Load Profile IDs for New Service Delivery Points*

TDSPs shall create and submit ESI IDs as new Service Delivery Points (SDPs) are established. It is the responsibility of the TDSP to make the Load Profile ID assignment for each new ESI ID. To assign the Load Profile Type for new ESI IDs, the TDSP shall

assign the default Load Profile Segment designated in Appendix D, Profile Decision Tree, on the “Segment Assignment” worksheet.

### ***9.1.3 Assignment of Load Profile IDs for New Electric Service Identifiers Resulting from a Mass Transition***

When a Mass Transition involves moving SDPs from one TDSP to another, the gaining TDSP creates and submits ESI IDs for all gained SDPs. To assign the Load Profile ID for new ESI IDs, the gaining TDSP shall obtain the current Load Profile ID assignment from either the losing TDSP or ERCOT. For detailed information on the Mass Customer Transition Process, please refer to Retail Market Guide.

### ***9.1.4 Assignment of BUSOGFLT Profile Type***

- (1) Competitive Retailers (CRs) seeking to have the Oil & Gas Flat (OGFLT) Profile Segment assigned to one of their Business (BUS) ESI IDs shall follow the instructions on the Oil & Gas tab of Appendix D, Profile Decision Tree.
- (2) ERCOT shall review all assignments of the BUSOGFLT Profile Type on a quarterly basis, per Section 11.3.3, Validation of BUSOGFLT Profile Type.

### ***9.1.5 Assignment of Load Profile IDs for Distributed Generation***

- (1) CRs seeking to have the profile segments for Photovoltaic, wind or other Distributed Generation (DG) assigned to one of their Residential (RES) or Business (BUS) ESI IDs shall follow the instructions on the “DG” tab of Appendix D, Profile Decision Tree.
- (2) ERCOT shall review all assignments of the Load Profile Segments for Photovoltaic, wind, and other DG on an annual basis, per Section 11.3.5, Validation of Profile Segments for Distributed Generation.

### ***9.1.6 kVA Metered Loads***

Any TDSP that routinely measures kVA Demand instead of kW Demand shall coordinate with the PWG to determine the Power Factor that shall be used to estimate their kW Demand, in accordance with Section 10, kVA to kW Conversion. Approved Power Factors are listed in Appendix D, Profile Decision Tree.

### ***9.1.7 Load Profile ID Assignment for Non-ERCOT Electric Service Identifiers***

- (1) TDSPs are required to assign ESI IDs for all SDPs within Texas, not just those within the ERCOT Region. Therefore, a Load Profile ID shall also be submitted to ERCOT by the respective TDSP, even though the non-ERCOT information shall not be used in ERCOT Settlements. To ensure that the non-ERCOT Load

Profile IDs are not confused with the ERCOT Load Profile IDs, it is necessary to give them names that are different than those for ESI IDs within ERCOT.

- (2) A list of valid Load Profile IDs to be assigned to ESI IDs within Texas, but outside of the ERCOT Region (non-ERCOT ESI IDs), is included in Appendix D, Profile Decision Tree, under the “Non-ERCOT Profile IDs” worksheet. TDSPs shall submit for approval to ERCOT additional names or changes for their non-ERCOT Load Profile IDs. The Load Profile ID may be no more than 30 characters in length. A comprehensive listing of non-ERCOT Load Profile IDs shall be maintained in the Profile Decision Tree.

### **9.1.8 Load Profile ID Assignment for Non-Opt In Entities**

NOIEs are required to submit Load Profile IDs for the ESI IDs that represent the NOIE metering points, as defined in Protocol Section 10, Metering. The Profile Decision Tree contains details on Load Profile ID assignments for NOIEs. The Load Profile ID shall be based on default values for four of the five fields in the Load Profile ID. The only component determined by the NOIE is the Weather Zone code. This is assigned based on the ZIP code at the metering point.

## **9.2 Processes to Change Load Profile ID Assignments**

- (1) ERCOT, a Transmission and/or Distribution Service Provider (TDSP), or a Competitive Retailer (CR) may request a change in the Load Profile ID assignment of an ESI ID. ERCOT may initiate a change as a result of the ERCOT Load Profile ID validation process. A TDSP shall initiate a change, when necessary, due to a change in the TDSP tariff to which the ESI ID is assigned, a meter type change, or an error with the Load Profile ID assignment. A CR may submit a change request to the TDSP when the CR believes there is an error in the existing Load Profile ID or when the CR believes adequate data has become available to replace a default Load Profile ID assigned to a new ESI ID. A Customer may request a Load Profile ID change by contacting their CR. Load Profile ID assignments shall always be based on the criteria defined in the appropriate Profile Decision Tree. Regardless of which Entity initiates a change in the Load Profile ID assignment for an ESI ID, the TDSP is responsible for formally updating ERCOT’s systems using the appropriate Texas Standard Electronic Transaction (TX SET).
- (2) All communication among Market Participants and between Market Participants and ERCOT regarding Load Profile ID changes shall be implemented per the appropriate TX SET transaction, except for alternative communication processes that are specified within the Load Profiling Guide (LPG).
- (3) For any change made to a Load Profile ID, it is the responsibility of the TDSP to make sure the effective date of change is concurrent with a specific meter read date and that the meter read information reaches ERCOT prior to the Load Profile ID change. For Load Profile ID changes that result from Annual Validation, a

TDSP tariff change, a meter type change, or a CR request to change a default Load Profile ID when adequate data becomes available, the TDSP shall submit the change after said meter read has been sent to ERCOT. For any Load Profile ID assignments that are found to be in error by dispute, the effective date of change shall be retroactive to the meter read date when no profile segment assignment error existed; however, the effective date of the change shall not go any farther back than what would affect the True-Up Settlement.

### **9.2.1 *Load Profile ID Changes Initiated By Transmission and/or Distribution Service Providers***

The TDSP may initiate a Load Profile ID change related to a TDSP tariff change, to correct previous assignment errors, or to reflect a meter type change. All Load Profile ID changes shall be processed according to TX SET transactions.

#### **9.2.1.1 *Load Profile ID Change Related to a Transmission and/or Distribution Service Provider Tariff Change***

When a Premise changes between residential and business TDSP tariffs, or when a meter type change is made for a TDSP tariff billing requirement, the TDSP is required to submit a Load Profile ID change effective on the meter read date of the TDSP tariff change.

#### **9.2.1.2 *Recognized Error in Current Assignment***

Should the TDSP become aware of an error in the assignment of a Load Profile ID, the TDSP shall notify the CR of the error as soon as practical and provide the date the Load Profile ID is to be changed and the effective date of that change. If there is a valid reason, the CR may request that the Load Profile ID change does not take place. This request shall be provided to the TDSP within three days of the expected date of change. If a dispute is created, refer to Section 14.2, General Load Profile ID Dispute Resolution Guidelines.

#### **9.2.1.3 *Load Profile ID Changes Resulting from Meter Type Changes***

The following subsections outline the procedures for implementing Load Profile ID changes when a meter type change occurs.

##### **9.2.1.3.1 *Non-Interval Data Recorder to Interval Data Recorder and Interval Data Recorder to Non-Interval Data Recorder***

The TDSP shall install the Non-Interval Data Recorder/Interval Data Recorder (NIDR/IDR) meter in accordance with the procedures specified by the Retail Market

Guide and submit the Load Profile ID change to ERCOT using the appropriate TX SET transaction with the effective date of the meter change once the meter/IDR installation is complete. Refer to Protocol Section 18.6, Installation and Use of Interval Data Recorder Meters.

#### **9.2.1.3.2            *Non-Time Of Use to Time Of Use***

The CR shall notify the appropriate TDSP when a Time Of Use (TOU) meter needs to be installed at a specific Premise and specify the schedule for the TOU meter. For a normal TOU meter installation, the TDSP has until the second regularly scheduled meter read date after receipt of the CR's request to install the TOU meter at the Premise and submit the Load Profile ID change to ERCOT. In accordance with TX SET, the TDSP shall communicate to the CR when the requested meter change is expected to take place. The Load Profile ID change shall not be submitted until the TOU meter has been installed. Only approved Time Of Use Schedules (TOUSs) specific to a TDSP service territory shall be available. These applicable TOUSs shall be found in Appendix D, Profile Decision Tree. If a Market Participant desires to use a TOUS that is not currently available in a specific TDSP service territory, the Market Participant shall follow the appropriate process to obtain approval of the new TOUS. When a new TOUS is approved, the TDSP shall inform ERCOT of the availability of this schedule. The new TOUS must be defined in Appendix D, Profile Decision Tree, and in the ERCOT systems. ERCOT will then notify the TDSP that it may submit the appropriate TX SET transaction to change the affected Load Profile IDs. If more than four TOU periods are requested by a CR for the approved new TOUS, TX SET changes and ERCOT system changes will be required.

#### **9.2.1.3.3            *Time Of Use to Non-Time Of Use***

The CR shall notify the TDSP when an ESI ID shall no longer be settled on a TOUS. The TDSP has the discretion to either leave the TOU meter in place or to replace the meter with a Non-Time Of Use (NOTOU) meter. Whether a meter change is made or not, the TDSP shall submit a Load Profile ID change in which the TOUS component of the Load Profile ID is NOTOU, which shall be effective at the next meter read date.

#### **9.2.1.3.4            *Business Demand to Business Non-Demand***

- (1) When Demand data is no longer required by the TDSP tariffs, and the CR has no need for Demand data then the TDSP shall change the assignment of the ESI ID to BUSNODEM. If a Demand meter is present and used for billing purposes, then the TDSP shall send Demand data to ERCOT via TX SET transactions.
- (2) When a TDSP determines that an ESI ID assignment should be changed to BUSNODEM based on the TDSP metering tariff rules, the TDSP shall notify the CR at least 30 days prior to making the Load Profile ID change. If the CR requires Demand data to support Customer billing for the ESI ID in question, then the CR shall notify the TDSP of its requirement for Demand data. Upon CR



- notification, the TDSP shall not change the Demand meter and the TDSP shall continue collecting Demand data. The ESI ID shall retain its Load factor Load Profile ID assignment.
- (3) If it is determined that Demand data is no longer required by either the CR or the TDSP, the TDSP has the option of:
    - (a) Replacing the Demand meter with a non-Demand meter; or
    - (b) Leaving the Demand meter in place but discontinuing sending any Demand data for that ESI ID to ERCOT.
  - (4) Regardless of which Demand meter change option the TDSP pursues, the effective date of the Load Profile ID change shall coincide with the last meter read date where Demand data is sent to ERCOT.
  - (5) If a TDSP elects to leave a Demand meter in service on an ESI ID that no longer requires a Demand meter, the Load Profile ID shall be changed to the BUSNODEM profile. The TDSP shall submit the appropriate TX SET transaction to change the Load Profile ID to ERCOT before the next regularly scheduled meter read date with an effective date of the last meter read.
  - (6) If the TDSP elects to replace the meter, then the TDSP shall submit the appropriate TX SET transaction to ERCOT to change the Load Profile ID with an effective date of the meter change date.

#### **9.2.1.3.5      *Non-Demand to Demand***

The CR shall notify the TDSP when it requires a specific ESI ID to have a Demand meter. Under normal Demand meter installations, the TDSP has until the second regularly scheduled meter read date after receipt of the CR's request to install the requested meter type at the Premise and submit the Load Profile ID change to ERCOT.

#### **9.2.1.4      CR Requested Change from a Default Load Profile ID**

After a new ESI ID has sufficient usage history, a CR may request a change from a default Load Profile ID using the ERCOT retail transaction issue resolution system. The requested Load Profile ID shall follow the guidelines for calculations contained in Appendix D, Profile Decision Tree. In the case of a Business ESI ID, the 12 months used in the calculations shall be the first 12 months of usage for the ESI ID. In the case of a residential ESI ID, the first consecutive seven months from October through April is all that is needed for the calculation of Winter Ratio. Once the Winter Ratio is known then the CR may request a change from the default Load Profile ID. After ERCOT has validated the CR's calculated Load Profile ID change request, ERCOT will then submit the request to the appropriate TDSP. The TDSP will verify that the change is consistent with their tariff and send the appropriate TX SET transaction to complete the request.

**ERCOT Load Profiling Guide**  
**Section 10: kVA to kW Conversion**

**October 1, 2010**

**10 KVA TO KW CONVERSION..... 10-1**

## 10 kVA TO kW CONVERSION

- (1) The majority of Transmission and/or Distribution Service Providers (TDSPs) meter kW Demand. However, some TDSPs only meter kVA Demand. To assign a Load Profile ID to an Electric Service Identifier (ESI ID), the kVA shall be converted to a kW value for the Load factor calculation for business Non-Interval Data Recorder (NIDR) Customers. This Section 10, kVA to kW Conversion, of the Load Profiling Guide (LPG) addresses how kVA shall be converted to kW for Load Profile ID assignments.
- (2) This Section of the LPG applies to any Market Participants such as:
  - (a) A TDSP that currently meters kVA;
  - (b) A TDSP that changes from kW to kVA metering; or
  - (c) A Non-Opt-In Entity (NOIE) that currently meters kVA and decides to opt-in.
- (3) Appendix D, Profile Decision Tree, defines how kVA is to be converted to kW (kW is equivalent to the product of kVA and Power Factor). The Power Factor(s) for this conversion shall be determined by a case study performed by the TDSP.
- (4) The TDSP shall submit their Power Factor(s) conversion case study to ERCOT for review and approval by ERCOT. The Profiling Working Group (PWG) shall meet and review the case study within 30 days of the submittal. Upon approval by the PWG, the request shall be sent to the Commercial Operations Subcommittee (COPS) and Technical Advisory Committee (TAC) for approval as appropriate. After approval of the case study, ERCOT shall update the Profile Decision Tree. The TDSP shall use the approved Power Factor(s) conversion for Load Profile ID assignments.
- (5) TDSPs that meter kVA shall review the performance of the Power Factor(s) periodically at the discretion of ERCOT or the PWG and either submit a revised Power Factor(s) case study or justification for maintaining the Power Factor(s) of their previous case study. The periodic reporting of Power Factor(s) conversion case studies is due at the end of September, unless circumstance warrants otherwise.
- (6) The case study shall detail the Power Factor analysis, which supports the specified Power Factor(s) for kVA to kW conversion. ERCOT and the PWG shall specify minimal reporting standards for Power Factor analysis to each requestor on a case-by-case basis. Complete and comprehensive case studies with statistical analyses shall be more readily approved.
- (7) Without approval of the case study, a default Power Factor of 1.0 shall be imposed. A default Power Factor of 1.0 means kVA shall be considered equivalent to kW.

**ERCOT Load Profiling Guide**  
**Section 11: Validation of Load Profile ID**

**June 1, 2013**

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## 11 VALIDATION OF LOAD PROFILE ID

- (1) A Load Profile ID is comprised of five components:
  - (a) Load Profile Type;
  - (b) Weather Zone;
  - (c) Meter Data Type;
  - (d) Weather sensitivity; and
  - (e) Time Of Use Schedule (TOUS).
- (2) ERCOT shall validate the first two components, the Load Profile Type and Weather Zone, at the following times:
  - (a) As part of the initial assignment of Load Profile IDs for Opt-In Entities;
  - (b) When Load Profile Segment definitions change; and
  - (c) At least one time per year during the Annual Validation process.
- (3) At the start of the validation process, the Transmission and/or Distribution Service Provider (TDSP) shall be asked to provide information on contact persons, both primary and backup. Reciprocally, ERCOT shall provide the TDSP information on an ERCOT contact person.
- (4) Regarding validation processes detailed in this section, electronic mail is the primary means of communication among ERCOT, the Profiling Working Group (PWG), and Market Participants. Other methods of communication shall be accommodated if all affected parties mutually agree to alternative methods.

### 11.1 Initial Assignment of Load Profile IDs for Opt-In Entities

- (1) When a Non-Opt-In Entity (NOIE) chooses to participate in the retail market, its business unit responsible for Transmission and/or Distribution Service Provider (TDSP) functions shall be subject to all requirements detailed in this Section 11.1, Initial Assignment of Load Profile IDs for Opt-In Entities, section for assigning Load Profile IDs to Electric Service Identifiers (ESI IDs).
- (2) Once the NOIE has given notice to ERCOT of its intent to participate in the retail market, the NOIE's business unit responsible for TDSP functions shall be responsible for submitting all assigned ESI IDs, their Load Profile Group, and their historical usage to ERCOT. For ESI IDs assigned to the non-metered group, the Opt-In Entity shall also submit their Profile Type. This information shall be submitted in a comma-delimited format at least 120 days prior to the effective start date of their entry into open market. The Opt-In Entity shall provide

monthly usage and Demand values that are available to the Opt-In Entity in an electronic format for a period of time established in cooperation with ERCOT on a case-by-case basis. Load Profile ID assignments shall be based on the criteria defined in Appendix D, Profile Decision Tree. ERCOT will calculate the Load Profile Segment using the historical usage provided by the Opt-In Entity for the specified time period. ERCOT and the Opt-In Entity shall work together to resolve any issues with the data provided by the Opt-In Entity. ERCOT shall provide the Opt-In Entity a file containing all of the ESI IDs and their Load Profile Type. The Opt-In Entity shall use the provided information to assign the Load Profile ID via the appropriate Texas Standard Electronic Transactions (TX SET). The schedule for submitting those transactions shall be coordinated with ERCOT.

### ***11.1.1 Validation of Initial Opt-In Entity Assignments***

- (1) The Opt-In Entity shall notify ERCOT Load Profiling via email when the transactions to create the Opt-In ESI IDs have been submitted and accepted in the ERCOT System. After receiving notification, ERCOT shall perform three additional reviews to ensure all ESI IDs are set up in accordance with the appropriate Profile Decision Tree.
  - (a) ERCOT will compare each ESI ID and Load Profile ID assignment in the ERCOT database with the previously approved initial Load Profile Type;
  - (b) ERCOT will validate that Weather Zone assignment is consistent with the appropriate Profile Decision Tree; and
  - (c) ERCOT shall validate Load Profile Group assignment for Residential and Business ESI IDs by using the Premise Type field in ERCOT's registration database. The Residential Load Profile Group must match the Residential Premise Type in the registration database. The Business Load Profile Group must match either the Small Non-Residential or Large Non-Residential Premise Type in the registration database.
- (2) Any discrepancies will be reported to the Opt-In Entity via email. The Opt-In Entity shall submit corrections to ERCOT via appropriate TX SET transaction or provide details as to why the data elements have changed.
- (3) The initial Load Profile ID assignment validation is complete after all discrepancies are resolved.

### **11.2 Annual Validation of Load Profile Type**

- (1) For the purposes of Annual Validation, ERCOT is responsible for determining the Load Profile Type assignment for all Residential and Business Load factor Electric Service Identifiers (ESI IDs). Transmission and/or Distribution Service



Providers (TDSPs) and ERCOT shall work closely and expeditiously with each other during the Annual Validation process.

- (2) When a date is listed in this Section 11.2 and a year is not specified, the date shall apply to the year in which the Annual Validation is performed.

***11.2.1 Annual Validation of Load Profile Type Assignment for RES and BUS Load Factor Electric Service Identifiers***

The following timeline shall be adhered to, unless otherwise approved by an appropriate Technical Advisory Committee (TAC) subcommittee. ERCOT shall utilize the historical usage and Demand data in its systems to derive usage time period values for each active and de-energized ESI ID for the time period specified in Appendix D, Profile Decision Tree.

- (a) Residential Load Profile Group Timeline
- (i) ERCOT shall determine the Load Profile Segment for the Load Profile ID for each active and de-energized ESI ID based on the current Profile Decision Tree in Appendix D. ERCOT shall provide the TDSPs with a list of Residential ESI IDs containing the current Load Profile Type and the recommended Load Profile Type for those ESI IDs where ERCOT recommends a change in Load Profile Type assignment. An electronic copy of each list shall be delivered to each TDSP no later than June 30.
  - (ii) For each ESI ID contained in the lists, the TDSPs shall review the recommended Load Profile Segment assignment and determine whether the recommended change is consistent with the TDSP tariffs, the applicable Retail Electric Provider (REP) billing requirements, and whether the ESI ID is active or de-energized. The TDSP shall then send finalized lists of ESI IDs back to ERCOT no later than July 10. The finalized lists shall indicate all revisions determined to be necessary by the TDSP.
  - (iii) ERCOT shall send notification to Competitive Retailers (CRs) and the Profiling Working Group (PWG) by July 15 announcing these lists are available to the CR of record. Upon request, ERCOT shall make available to the current CR of record the list of those ESI IDs that are expected to have a Load Profile ID change as a result of Annual Validation.
  - (iv) The TDSPs shall coordinate with ERCOT to submit the necessary Texas Standard Electronic Transaction (TX SET) transactions to update Load Profile ID assignments for the population of the Residential Load Profile Group to be effective on the most current meter read date on or after August 15.

- (v) TDSPs are responsible for verifying that TX SET transactions related to Annual Validation have been successfully accepted into ERCOT's systems by monitoring the appropriate response transactions. The TDSPs and ERCOT shall work together to have TX SET transactions successfully completed for the Residential Load Profile Group by September 30.
  - (vi) Within the first two Business Days of the TDSP successfully submitting all of its Residential transactions, ERCOT shall compare the finalized lists of recommended changes with the current Load Profile ID in the ERCOT system. ERCOT and the TDSPs shall work closely and expeditiously to resolve any discrepancies. The TDSP and ERCOT shall be in contact until at least 99.0% of the finalized list of changes is resolved to their mutual satisfaction.
  - (vii) ERCOT and the TDSPs shall provide regular updates on the progress of Annual Validation as needed, or at a minimum during the regularly scheduled PWG meetings.
- (b) Business Load Profile Group Timeline
- (i) ERCOT shall determine the Load Profile Type for the Load Profile ID for each active and de-energized ESI ID based on the current Profile Decision Tree (Appendix D). ERCOT shall provide the TDSPs with a list of Business Load factor ESI IDs containing the current Load Profile Type and the recommended Load Profile Segment for those ESI IDs where ERCOT recommends a change in Load Profile Segment assignment. An electronic copy of each list shall be delivered to each TDSP no later than August 15.
  - (ii) For each ESI ID in the lists, the TDSPs shall review the recommended Load Profile Segment assignment and determine whether the recommended change is consistent with the TDSP tariffs, the applicable Retail Electric Provider (REP) billing requirements, and whether the ESI ID is active or de-energized. The TDSP shall then send finalized lists of ESI IDs back to ERCOT no later than August 25. The finalized lists shall indicate all revisions determined to be necessary by the TDSP.
  - (iii) ERCOT shall send Notification to CRs and the PWG by September 1 announcing these lists are available to the CR of record. Upon request, ERCOT shall make available to the current CR of record the list of those ESI IDs that are expected to have a Load Profile ID change as a result of Annual Validation.

- (iv) The TDSPs shall coordinate with ERCOT to submit the necessary TX SET transactions to update Load Profile ID assignments for the population of Business Load factor group to be effective on the most current meter read date on or after October 1.
- (v) TDSPs are responsible for verifying that TX SET transactions related to Annual Validation have been successfully accepted into ERCOT's systems by monitoring the appropriate response transactions. The TDSPs and ERCOT shall work together to have TX SET transactions successfully completed for the Business Load factor group by November 30.
- (vi) Within the first two Business Days of the TDSP successfully submitting all of its Business Load factor transactions, ERCOT shall compare the finalized lists of recommended changes with the current Load Profile Segment in the ERCOT system. ERCOT and the TDSPs shall work closely and expeditiously to resolve any discrepancies. The TDSP and ERCOT shall be in contact until at least 99.0% of the finalized list of changes is resolved to their mutual satisfaction.
- (vii) ERCOT and the TDSPs shall provide regular updates on the progress of Annual Validation as needed, or at a minimum during the regularly scheduled PWG meetings.

### **11.3 Additional Validations**

On a quarterly basis, at minimum, ERCOT shall perform additional validations to identify potentially incorrect Load Profile ID or Premise Type assignments. For those Electronic Service Identifiers (ESI IDs) flagged for review, the issue dispute resolution process will be utilized to notify the Transmission and/or Distribution Service Provider (TDSP) of all identified issues. If a Load Profile ID or Premise Type change is necessary, the TDSP shall update the Load Profile ID in the ERCOT system using the appropriate Texas Standard Electronic Transaction (TX SET) transaction.

#### **11.3.1 Validation of BUSNODEM Profile Type**

ERCOT shall review the most recent 12-months usage for all ESI IDs classified as Business Non-Demand (BUSNODEM) Profile Type and identify any data values that fall outside the expectations of the BUSNODEM Profile Type. ERCOT shall report any discrepancies to the respective TDSPs.

### ***11.3.2 Validation of BUS Load Factor Profile Types***

ERCOT shall review all ESI IDs and their usage which are classified with a Business (BUS) Load Factor Profile Type and identify those ESI IDs where no Demand values have been submitted during the 12-month period being reviewed.

### ***11.3.3 Validation of BUSOGFLT Profile Type***

ERCOT shall verify that only eligible ESI IDs are assigned the Business Oil and Gas Flat (BUSOGFLT) Profile Type. Should an ESI ID be found to have been assigned the BUSOGFLT Profile Type erroneously, ERCOT shall work with the TDSP to have the Profile Type assignment corrected, and ERCOT shall notify the CR of record.

### ***11.3.4 Validation of NMFLAT and NMLIGHT Profile Types***

ERCOT shall review all ESI IDs and their usage which are classified with either a Non-Metered Flat (NMFLAT) or Non-Metered Light (NMLIGHT) Profile Type and calculate the Average Daily Use (ADU) for each ESI ID. ESI IDs with excessive fluctuation over the 12-month period being reviewed shall be reported to the TDSP.

### ***11.3.5 Validation of Profile Segments for Distributed Generation***

ERCOT shall verify that only eligible ESI IDs are assigned Load Profile Segments for Distributed Generation (DG). For ESI IDs found to have been assigned a profile segment for DG erroneously, ERCOT shall work with the TDSP to have the profile segment assignment corrected.

### ***11.3.6 Comparison of Profile Type to Premise Type***

ERCOT shall review and identify all ESI IDs with conflicting Profile and Premise Type combinations. Any discrepancies shall be reported to the TDSP.

### ***11.3.7 Validation of Service Address Zone Improvement Plan Code***

ERCOT shall validate that the service address Zone Improvement Plan (ZIP) code for each ESI ID is located within the ERCOT region, and shall perform consistency checks for Congestion Zone, TDSP service area, and substation. ERCOT shall provide lists to the TDSP of any ESI IDs which have been identified as having a suspect ZIP code or substation assignment.

### ***11.3.8 Validation of Weather Zone Code***

ERCOT shall compare the current ESI ID Weather Zone component of the Load Profile ID to the Weather Zone assignment based on the current Profile Decision Tree in Appendix D, Profile Decision Tree, utilizing the service address ZIP code in ERCOT's system. Any discrepancies shall be reported to the TDSP.

### ***11.3.9 Comparison of Meter Data Type Code to Profile Type Code***

ERCOT shall compare the Meter Data Type code component of the Profile ID to the Load Profile Group code for all ESI IDs. Any discrepancies shall be reported to the TDSP.

### ***11.3.10 Comparison of Weather Sensitivity Code to Meter Data Type Code***

ERCOT shall verify that all ESI IDs with a Meter Data Type of Non-Interval Data Recorder (NIDR) are assigned a Weather Sensitivity code of Non-Weather Sensitivity (NWS). ERCOT shall also verify that only ESI IDs having a Meter Data Type of IDR which were identified by ERCOT during the most recent weather sensitivity analysis as being weather sensitive are assigned a weather sensitivity code of WS. Any discrepancies shall be reported to the TDSP. The annual procedures for reviewing of the weather sensitivity code are located in Protocol Section 11.4.3.1, Weather Responsiveness Determination.

**ERCOT Load Profiling Guide**  
**Section 12: Request for Load Profile Segment Changes,  
Additions, or Removals**

**December 1, 2010**

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## **12 REQUEST FOR LOAD PROFILE SEGMENT CHANGES, ADDITIONS, OR REMOVALS**

- (1) This Section 12, Request for Load Profile Segment Changes, Additions, or Removals, of the Load Profiling Guide (LPG) addresses changes, additions, and deletions to Load Profile Segments, with the exception of Load Profile Segment modifications addressed in Section 16, Supplemental Load Profiling.
- (2) The steps and tests identified to introduce new Load Profiles or changes to Load Profiles are intended to fulfill the criteria established in Protocol Section 18.2.1, Guidelines for Development of Load Profiles. With market experience and an increase in the availability of Load research data, the Profiling Working Group (PWG) expects the accuracy and precision of the Load Profiles to improve. Threshold values in establishing criteria for Load Profile changes shall be determined with market experience.
- (3) Any change to Load Profile ID assignments resulting from an approved modification to the definitions of Load Profile Segments shall not be retroactively applied.

### **12.1 Types of Requests**

The following types of requests are addressed in this Section 12.1, Types of Requests.

- (a) Creation of a new Load Profile Segment from one or more existing Load Profile Segments;
- (b) Redefinition of existing Load Profile Segments; and
- (c) Removal of existing Load Profile Segments.

#### ***12.1.1 Creation of a New Load Profile Segment***

- (1) When a new Load Profile Segment is created, there may be an impact to one or more existing Load Profile Segments. This new segment will be applied to Electric Service Identifiers (ESI IDs) that are removed from one or more existing Load Profile Segments.
- (2) If a new Load Profile Segment is created, adjustments may be required to the affected existing Load Profile Segment(s).



### **12.1.2 *Redefinition of an Existing Load Profile Segment***

Redefinition of existing Load Profile Segment parameters requires that some ESI IDs be moved from one segment to another. Thus, a change for existing profile segment parameters impacts at least two Load Profile Segments.

### **12.1.3 *Removal of Existing Load Profiles Segments***

- (1) A request to remove an existing Load Profile Segment shall provide information similar to that required for the creation or change of a segment. Supporting documentation shall provide evidence that the Load Profile proposed for removal does not satisfy the standards for a separate Load Profile. Specifically, the group represented by the Load Profile may be as follows:
  - (a) Too small to justify a separate Load Profile Segment, as described in Section 12.5, Groups of Electric Service Identifiers Eligible to Become Load Profile Segments; and/or
  - (b) Sufficiently similar to one or more existing Load Profiles, according to the measures defined in Section 12.5.
- (2) Removal of an existing Load Profile Segment necessarily means changing definitions of one or more existing Load Profile Segments to include the ESI IDs currently in the proposed removed segment. Accordingly, a request to remove a Load Profile Segment shall typically require supporting documentation for changing the definition of an existing segment.

## **12.2 Request for Load Profile Segment Changes**

Any Market Participant, ERCOT, or the Profiling Working Group (PWG) may submit a request for a change to Load Profile Segments according to the procedures outlined in Section 12, Request for Load Profile Segment Changes, Additions, or Removals.

### **12.3 Procedure for Submitting a Request**

- (1) ERCOT shall post a Load Profile Segment change request form to the ERCOT website. A completed application form shall accompany all requests for a Load Profile Segment change. Data sets, supporting files, and documentation shall be provided in electronic form.
- (2) If the originator of the Load Profile Segment change request is a Market Participant other than ERCOT, they shall indicate on the submitted form that they are requesting either a conditional or full approval of the change. Subsequent to submitting the form, the originator may amend the request from being conditional to full or vice versa by notifying ERCOT and the Profiling Working Group (PWG).

## 12.4 Process Timing for Requesting Changes

- (1) Requests for changes may be submitted to ERCOT at any time. Within two Business Days of receiving the request, ERCOT shall reply to the submitter indicating that the request has been received.
- (2) As required by Protocol Section 18.2.8, Adjustments and Changes to Load Profile Development, ERCOT shall respond to the request within 60 days. This period does not include the time required to analyze and render the final decision of the request. The response shall indicate:
  - (a) Whether the request is complete;
  - (b) The date by which a recommendation on the request is expected to be ready and available to the requestor;
  - (c) The date by which the recommendation is expected to be presented to the Profiling Working Group (PWG); and
  - (d) The best guess time the requested change is expected to be implemented (ready for Settlement), if approved.
- (3) During ERCOT's evaluation of the request, ERCOT may request supplemental information determined to be important to justifying the new segment.
- (4) The requester is not required to provide supplemental information for an otherwise complete request. If ERCOT determines that supplemental information is important, failure to provide this information may be considered as a weakness in the support for the request.
- (5) A requestor may, at their discretion, submit a Load Profile Segment change request with supporting information and documentation, which includes all the criteria listed in Section 12.6, Information Required with Request for Change, except for providing Load research sample data of sufficient quality to support the request. In this case, the requestor shall indicate that the request is for conditional approval.
- (6) Upon completion of the review outlined in Section 12.8, Evaluation of the Request, ERCOT shall make a recommendation to the PWG regarding conditional approval. If the recommendation is to grant conditional approval, then ERCOT shall specify the requirements for additional Load research sampling and the specific and objective criteria to be met by the analysis of the Load research data collected with the additional sampling to meet the requirements for final approval.
- (7) According to Protocol Section 18.2.8, ERCOT shall provide appropriate notice to all Market Participants prior to implementation of any change. Load Profile ID

changes to each Electric Service Identifier (ESI ID) shall be made in accordance with Section 9.2, Processes to Change Load Profile ID Assignments.

## **12.5 Groups of Electric Service Identifiers Eligible to Become Load Profile Segments**

- (1) For a group of Electric Service Identifiers (ESI IDs) to be a distinct Load Profile Segment, the group shall satisfy the following requirements:
  - (a) The group is based on readily identifiable parameters, which are not subject to frequent change;
  - (b) The group is reasonably homogeneous as defined in Section 12.6.4, Homogeneity;
  - (c) The group is sufficiently different from other existing Load Profiles as defined in Section 12.6.2, Difference from Current Load Profiles; and
  - (d) The group is of sufficient size to justify its own profile segment as defined in Section 12.6.3, Size.
- (2) In the case of a small market segment, installation of Interval Data Recorders (IDRs) on all ESI IDs in the segment may be more practical than profiling. A request for a new Load Profile Segment may be denied based on this consideration. ERCOT shall not be responsible for installing IDRs in such a case, nor for the costs of such installation. These responsibilities remain with the requestor.
- (3) A Competitive Retailer (CR) always has the option to arrange for installation of IDRs for use in Settlement for all ESI IDs the CR serves in the proposed segment, per Protocol Section 18.6.1, Interval Data Recorder Meter Mandatory Installation Requirements.
- (4) Further description of these requirements and the information that shall be submitted with the request are detailed in Section 12.6, Information Required with Request for Change. Evaluation of the request shall consider all nine guidelines in the Protocol Section 18.2.1, Guidelines for Development of Load Profiles.

### ***12.5.1 Universal Load Profile Segment Applicability***

- (1) As a general rule, a Load Profile Segment definition shall be universally applicable. Universally applicable means:
  - (a) The Load Profile may be applicable to all CRs;

- (b) Once defined, the Load Profile shall be applied to any ESI ID that meets the eligibility criteria;
  - (c) The Load Profile shall be public; and
  - (d) The decision to add the Load Profile shall not be based solely on the private interests of the requestor.
- (2) There are limited exceptions as described in Section 16, Supplemental Load Profiling.

### ***12.5.2 List-Based Load Profile Segments***

- (1) An additional exception to the requirement of universal applicability is a list-based Load Profile Segment. A list-based Load Profile Segment is defined solely by a list of ESI IDs submitted by the requestor, not by other objectively observable characteristics. The list-based segment may be specific to a single CR, and shall be applied only to the ESI IDs on the list.
- (2) The Load Profile shall satisfy items (1)(c) and (1)(d) of Section 12.5.1, Universal Load Profile Segment Applicability. A list-based segment also shall satisfy items (1)(a) through (1)(d) of Section 12.5, Groups of Electric Service Identifiers Eligible to Become Load Profile Segments. ERCOT shall perform all validation, audit checks and normal managing of Load Profile Segments as currently defined.
- (3) If additional data are needed in ERCOT systems to implement the list-based Load Profile in the market, the requestor shall provide strong justification. To the extent that greater costs are associated with implementation of a list-based segment compared to a universally applicable segment, the size of the proposed segment may be larger to justify the change.

## **12.6 Information Required with Request for Change**

All requests shall include the following:

- (a) Unambiguous group identification;
- (b) Difference from current Load Profile Segments;
- (c) Size;
- (d) Homogeneity; and
- (e) Quality assurance methodology for Electric Service Identifiers (ESI ID) identification

### **12.6.1 Unambiguous Group Identification**

The definition of the group shall be provided in the request for the new Load Profile Segment. The request shall unambiguously define specific criteria for an ESI ID to be included in the new Load Profile Segment. In a request to change an existing Load Profile Segment, the group to be re-assigned shall be identified. The change in basic segment definition shall also be specified. For example, the requested change in definition may specify moving the Load factor boundary between two segments. In this case, the group affected by the change would be the group between the old and new boundaries.

#### **12.6.1.1 Identification Based on Data Currently in ERCOT's Systems**

- (1) The most direct way a group may satisfy the requirement of being unambiguously identified occurs when the group may be identified based solely on information available in the ERCOT data systems or readily derived from such data.
- (2) Examples of information available in or derived from the ERCOT data systems include, but are not limited to:
  - (a) Monthly or annual kWh consumption;
  - (b) Metered monthly or annual peak Demand for Demand-metered Customers;
  - (c) Monthly or annual Load factor;
  - (d) Ratio of seasonal consumption values; and
  - (e) Zone Improvement Plan (ZIP) code.

#### **12.6.1.2 Identification Based on Other Means**

Segments based on other criteria may be requested. ERCOT, in coordination with the Profiling Working Group (PWG), shall evaluate such requests in terms of the feasibility and reliability of the proposed identification method. If the method requires data not currently in ERCOT's systems, the request shall describe how these data shall be made available to ERCOT on an ongoing basis. If the identification method is judged to be impractical or unreliable, the request may be denied.

#### **12.6.1.3 List-Based Load Profile Segments**

- (1) A list-based Load Profile Segment is defined by specifying a list of ESI IDs to be included in the Load Profile Segment. The submitter of a request for a list-based segment shall demonstrate that the list consists of a valid, objectively verifiable, and meaningful population.

- (2) The submitter also shall adhere to the requirements of Section 12.6.5, Quality Assurance Methodology for Electric Service Identifier Identification.
- (3) The submitter shall also demonstrate that multiple list-based segment definitions may be managed as a practical matter. Issues to be addressed in this regard include:
  - (a) Demonstrating that the population so defined is not subject to frequent change;
  - (b) Preventing an ESI ID from appearing on multiple lists;
  - (c) Limiting opportunities for unsubstantiated or inappropriate profile assignments; and
  - (d) Merging lists for list-based Load Profile Segments.

### ***12.6.2 Difference from Current Load Profile Segments***

- (1) A requested new Load Profile Segment shall be shown in the supporting documentation to be different from existing Load Profiles in ways that improve the accuracy of Settlement.
- (2) In a request to change existing Load Profile Segments, the documentation shall show that the group re-assigned from one segment to another is more similar to the proposed new assignment(s) than to the old one, in ways that improve the accuracy of Settlement.
- (3) If documentation demonstrates that the ESI IDs in the requested Load Profile Segment are different from the Load Profile Segment that they are currently assigned and more similar to another existing Load Profile Segment, then the resolution of the request may be to reassign these ESI IDs to the most similar existing Load Profile Segment.
- (4) Requests to create new Load Profile Segments or to change the definition of existing segments require supporting documentation to provide a basis for assessing differences between the affected group and existing Load Profile Segments. All differences between Load Profiles that are important for evaluating a change shall be supported in the request.

#### **12.6.2.1 Supporting Data Required**

It is in the requestor's best interest to submit data that are as comprehensive as possible. For Load data and for other supporting information, data from multiple years shall provide stronger support than from a single year. Types of data that may be submitted and the associated documentation are described in the following subsections.

**12.6.2.1.1 Load Research Data**

- (1) As supporting documentation of difference from existing Load Profiles, the strongest evidence would be a statistically valid Load research sample from the proposed segment population, which may be compared with the assigned Load Profiles. Likewise, the strongest evidence that an affected group is more similar to a proposed re-assigned Load Profile Segment than to its current assignment would be a statistically valid Load research sample from the affected group.
- (2) The Load data shall be submitted in electronic format. Data shall be provided for individual Premises with stratum indicators and associated weighting factors, as well as for the segment average. Also required is documentation of variables in the data set, time frame of the data collection, Sample Design and sample implementation procedures, data cleaning procedures, and weighting methods.
- (3) Examples of less compelling, but supportive documentation would be other types of Load research data, such as:
  - (a) Data from ad-hoc or convenience samples; and
  - (b) Data from a similar population from another area.
- (4) When less compelling data is submitted, the submitter should also submit evidence to support the applicability of the data to the proposed Load Profile Segment population. If the supporting evidence is only marginally convincing, the requestor is encouraged to submit a request for conditional approval as outlined in Section 12.4, Process Timing for Requesting Changes.

**12.6.2.1.2 Other Kinds of Supporting Data**

Less direct evidence of differences in Load patterns may also be submitted. Examples of possible data include:

- (a) Documentation of operating schedules for the proposed group and comparison with typical schedules for Premises in the currently assigned Load Profile;
- (b) End-use saturation data, comparing the proportions of Premises with particular types of electric end uses for the proposed group and currently assigned Load Profiles. Such data shall be relevant to the proposed population in ERCOT; and
- (c) Monthly billing data comparing consumption patterns, particularly related to heating and cooling. Such comparisons shall be made separately by Weather Zone, or otherwise account for variations by Weather Zone.

### **12.6.2.2 Basis for Assessment of Differences Based on Load Research Data**

- (1) In assessing differences between the initial profile segment and the requested profile segment, based on Load research data, ERCOT shall consider measures of differences such as the following:
  - (a) Summary statistics on differences of series;
  - (b) Load-weighted average price;
  - (c) On/off peak ratio;
  - (d) Load factor; and
  - (e) Deadweight loss
- (2) ERCOT shall calculate such measures from the Load research data submitted. The requester may submit analysis including such calculations, but is not required to do so.
- (3) Formulas for these measures and illustrative examples of these calculations are provided in Appendix C, Measuring Differences Between Load Profiles. In the terminology used in Appendix C, the Load Profile representing the proposed segment is the “Target Profile.” The existing profile for the segment to which the group is otherwise assigned is the “Base Profile.”

### **12.6.2.3 Accounting for Weather Zone Effects in Load Profile Comparisons**

- (1) Comparisons between profiles for proposed segments and existing Load Profiles shall take into account Weather Zone effects on modeled Load Profiles. These effects may be accounted for in the comparisons in one of two ways:
  - (a) The comparison between the proposed segment and the existing Load Profile is made separately for each Weather Zone; and
  - (b) A single Load Profile representing the proposed segment as a whole is compared with a single composite Load Profile for the existing segment.
- (2) These methods are not required for Load Profiles that are the same across all Weather Zones.

### **12.6.2.4 Separate Comparisons for Each Weather Zone**

- (1) If Load research data for individual sample Customers are provided for the proposed segment, a separate profile may be constructed for each Weather Zone. A separate profile for a Weather Zone is calculated by expanding the Load



research data using the same expansion weights as for the overall sample, but using sample points only from that Weather Zone. Separate comparisons by Weather Zone may also be possible if individual sample point data are not submitted, but different estimated profiles are submitted representing the proposed segment for different Weather Zones. The Weather Zone profile for the proposed segment is then compared with the existing Load Profiles for the proposed weather segments.

- (2) The limitation of separate comparisons by Weather Zone is that some or all of the separate Weather Zone profiles may have large statistical errors due to low sample sizes. The magnitude of these errors should be considered in assessing the comparisons.

### 12.6.2.5 Comparison for the Proposed Segment as a Whole

- (1) If a single Load Profile is estimated for the proposed segment as a whole across several Weather Zones, this Load Profile may be compared with a composite of existing Load Profiles. The composite shall be constructed such that the mix of Weather Zones in the composite is as similar as possible to that of the proposed segment population represented by the Load research data submitted.
- (2) The appropriate composite existing Load Profile ( $f_{*t}$ ) may be calculated from the separate Weather Zone profiles as:

$$f_{*t} = \frac{\sum_{z=1}^n [E_z f_{zt}]}{\sum_{z=1}^n [E_z]}$$

Where

$f_{*t}$  = Interval fraction at interval t for the composite Load Profile,

$E_z$  = Total annual energy of ESI IDs in the proposed segment in Weather Zone z,

$f_{zt}$  = Interval fraction at interval t for the existing Load Profile using the weather data for Weather Zone, and

$n$  = Total number of Weather Zones.

Calculation of interval fractions ( $f_t$ ) are described in Appendix C, Measuring Differences Between Load Profiles.

- (3) A request that includes Load research data as supporting evidence shall include estimates of the total energy amounts  $E_z$  in each Weather Zone, for use in

calculating the composite existing profile. If the Load Profile submitted to represent the proposed segment is not representative of the distribution of Customers across Weather Zones, the request shall provide estimates of the energy amounts or energy proportions contributing to the requested Load Profile. The comparison composite existing Load Profile shall then be calculated using the energy amounts that correspond to the Load Profile requested.

#### **12.6.2.6 Summary Statistics on Differences of Series**

- (1) Several types of series characteristics – that is, characteristics described by a series of numbers rather than a single number – may be calculated for each Load Profile. Various summary statistics may then be used to describe how different two series are. These series and summary measures of differences are described in Appendix C, Measuring Differences Between Load Profiles.

The series mentioned above include:

- (a) Unitized Load;
  - (b) Monthly fractions;
  - (c) Daily fractions; and
  - (d) Clock-hour fractions.
- (2) Each of these series may be calculated for a Load Profile representing the proposed segment and for the existing Load Profile or Load Profile that would otherwise be assigned.
  - (3) The difference between the series for the proposed and existing Load Profiles is then measured in terms of one of the following summary statistics:
    - (a) Mean difference;
    - (b) Mean absolute percent error;
    - (c) Mean absolute deviation; and
    - (d) Root mean square error.

#### **12.6.2.7 Load-Weighted Average Price**

Load-weighted average annual price is calculated using a Load Profile representing the proposed segment, and using the Load Profile for the currently assigned or existing segment. The difference in Load-weighted annual price between these two Load Profiles is one measure of difference.

### **12.6.2.8 On-Peak/Off-Peak Ratio**

The ratio of on-peak to off-peak consumption is calculated using the Load Profile representing the proposed segment and for the existing Load Profiles. The ratio for the existing Load Profile is subtracted from the ratio for the proposed segment profile. If this ratio is provided, then the requestor shall define the on- and off-peak periods.

### **12.6.2.9 Load Factor**

The Load factor is calculated for the Load Profile for the proposed segment and for the existing Load Profile. The Load factor for the existing Load Profile is subtracted from that of the proposed segment profile. For a proposed segment with a peak occurring during system on-peak hours, Load factors may be compared only for existing Load Profiles with peaks during on-peak hours. For a proposed segment with a peak occurring during system off-peak hours, Load factors may be compared only for existing profiles with peaks during off-peak hours.

### **12.6.2.10 Deadweight Loss**

The deadweight loss reduction due to changing some existing segments into a different set of segments may be calculated. Appendix C, Measuring Differences Between Load Profiles, provides the equations for calculating the deadweight loss reduction due to creating separate Load Profiles for each of several sub-segments rather than representing all of them by a common Load Profile. An equation is also provided for the deadweight loss reduction from segment changes that are not simple subdivisions.

## **12.6.3 Size**

- (1) Supporting documentation shall show that the proposed segment(s) is of sufficient size to justify a separate segment. Size shall be provided in terms of both number of Customers and total energy consumption.
- (2) If the proposed segment is identified based on information available in the ERCOT data system and also available to the requesting party, documentation of the total ESI ID count and annual energy use is sufficient. ERCOT shall verify this information using the ERCOT data system.
- (3) If the requesting party has information on only a portion of the population in the segment, the request shall include estimates of the ESI ID counts and energy use, and documentation of the basis for the estimates.

### 12.6.4 Homogeneity

For a new Load Profile Segment, the request shall provide evidence that the requested group is homogeneous with respect to Load shape characteristics. For a change to definitions of existing segments, the request shall provide evidence that the re-defined segments are homogeneous in these terms.

#### 12.6.4.1 Load Research Demonstrating Homogeneity

- (1) The strongest evidence of homogeneity may be provided by a statistically valid Load research sample from the population of the requested segment(s). Statistical validity shall be documented as described above in Section 12.6.2, Difference from Current Profiles.
- (2) From the Load research data, the variance and relative standard deviation across the population of Load-shape parameters shall be assessed. A key parameter for which variance shall be calculated is the Load-weighted average price. For a stratified Load research sample, the energy-weighted variance is calculated as follows:

$$Var(U) = \frac{\sum_k \sum_{j=1}^{n_k} [w_{kj} E_{kj} ((U_{kj} - U_{pop})^2)]}{\sum_k \sum_{j=1}^{n_k} [w_{kj} E_{kj}]}$$

Where

j = Sample Customer,

k = Stratum indicator,

$n_k$  = Number of Customers in the sample in stratum k,

$E_{kj}$  = Annual energy for sample Customer j in stratum k,

$w_{kj}$  = Expansion weight for Customer j in stratum k,

$U_{kj}$  = Load-weighted average price calculated using the Load shape of Customer j in stratum k, and

$U_{pop}$  = Load-weighted average price calculated using the (estimated) population Load shape.

- (3) If the energy amount  $E_{kj}$  is not included in the formula, the result is the ordinary variance. For Load-weighted average price, the energy-weighted variance is more relevant to assessing population variability.

The standard deviation is calculated from the (energy-weighted or ordinary) variance as:

$$SD(U) = \sqrt{Var(U)}$$

The relative standard deviation is then:

$$RSD(U) = SD(U)/U$$

- (4) Other parameters for which population variances and relative standard deviations may be estimated analogously include Load factor, ratio of on- to off-peak usage, and fraction of consumption occurring during on-peak periods.
- (5) As for demonstration of differences from existing Load Profiles, lesser evidence may be provided based on analysis of Load data from case studies, samples of convenience, or Transmission and/or Distribution Service Provider (TDSP) distribution feeders.

#### **12.6.4.2 Other Supporting Evidence of Homogeneity**

Less direct evidence of Load shape homogeneity may be submitted. Examples of such evidence include:

- (a) Survey data or other evidence of appliance or equipment present in the Premises;
- (b) Data on operating schedules; and
- (c) Variances of parameters of monthly billing data, such as size, ratio of seasonal consumption values, or Load factors.

#### **12.6.5 Quality Assurance Methodology for Electric Service Identifier Identification**

- (1) If the procedure for identifying ESI IDs applicable to the new Load Profile Segment relies on data that is not currently in ERCOT's systems, the requestor shall submit the description of a quality assurance procedure, to be managed by ERCOT, to assure that ESI IDs are assigned correctly to the Load Profile Segment and that they are removed from the Load Profile Segment when appropriate.
- (2) The described quality assurance procedure shall be accurate, workable, and reasonable in terms of cost and timeliness. An ideal quality assurance procedure would be one that enables ERCOT to have direct access to a data source of well established reliability, and is maintained by a disinterested third party. If the validity of the data source has not been well established, a quality control sample, as described below, may be used for quality assurance purposes.

- (3) At a minimum, the quality assurance procedure shall meet a classification accuracy of  $\pm 5\%$  at 95% confidence such as could be obtained with a random sample for quality control purposes. If random sampling is identified as the quality assurance methodology, the sampling shall be managed and administered by ERCOT.
- (4) Adequacy of the quality assurance methodology shall be a primary consideration in deciding whether to approve or disapprove the Load Profile Segment change request.

### **12.7 Costs for Profile Segment Changes**

- (1) The party requesting the segment change shall bear all costs associated with developing the supporting data and documentation that is submitted to ERCOT for evaluation of the proposed Load Profile Segment changes. In addition, the requestor shall bear all costs, except for ERCOT's analytical costs, for additional Load research required in conjunction with a request for conditional approval of a Load Profile Segment change.
- (2) In the event the change is approved, costs for implementing the changes in ERCOT data systems shall be the responsibility of ERCOT. Responsibility for re-assigning Load Profiles remains with the Transmission and/or Distribution Service Provider (TDSP).
- (3) If a Load Profile Segment change request receives final approval under the provisions of the Load Profiling Guide (LPG), and results in the adoption of a new Load Profile Segment available to all Competitive Retailers (CRs), the provisions of Protocol Section 9.18, Profile Development Cost Recovery Fee for a Non-ERCOT Sponsored Load Profile Segment, shall be followed to provide for compensating the requestor by CRs seeking to assign Customers to the Load Profile Segment. Once a Load Profile Segment change request receives final approval, any subsequent costs required for ongoing support of the Load Profile Segment shall be considered part of the usual operation and maintenance expense for Load Profile Segments available for use by all CRs.

### **12.8 Evaluation of the Request**

- (1) ERCOT shall assess the request based on the data and analysis submitted with the request as well as possible additional analysis by ERCOT. In the evaluation assessment, ERCOT shall balance the objectives listed in Protocol Section 18.2.1, Guidelines for Development of Load Profiles.
- (2) If the request is for conditional qualification, any supporting Load research data accompanying the request shall be evaluated as to the degree of support provided for the request. Lack of Load research data of sufficient quality or quantity to receive final approval of the Load Profile Segment request shall not be deemed as

- grounds for denial of the conditional qualification. Based on their review of the submitted data and analysis along with any additional ERCOT analysis, ERCOT shall make a recommendation to the Profiling Working Group (PWG) and the requestor regarding additional Load research sampling needed to support the request. ERCOT shall also define specific and objective criteria to be met by the analysis of the Load research data collected with the additional sampling to meet the requirements for final approval.
- (3) Factors considered in assessing requests shall include, if applicable:
- (a) The quality of the supporting data provided;
  - (b) The magnitude of differences indicated;
  - (c) The size of the affected population;
  - (d) The homogeneity of the population;
  - (e) The reliability of the estimates of differences, size, and homogeneity;
  - (f) The impact on the Settlement cost allocations;
  - (g) The effect on the rest of the market if the change is accepted;
  - (h) The feasibility and reliability of the population identification method;
  - (i) The potential for Customer migration in and out of the proposed segment; and
  - (j) The feasibility and reliability of the quality assurance methodology for Electric Service Identifier (ESI ID) identification.

## **12.9 Resolution of the Request**

### ***12.9.1 ERCOT Staff Initial Recommendation***

ERCOT shall provide a written report detailing their evaluation of the Load Profile Segment change request to the submitter on or before the date specified in Section 12.4, Process Timing for Requesting Changes. If ERCOT is unable to meet the specified deadline, they shall notify the submitter prior to the date and specify a revised date by which the report shall be available.

### ***12.9.2 Submitter and ERCOT Revisions***

- (1) Upon receipt of the written report, the submitter shall have up to 30 days to make comments and recommendations to ERCOT. Upon receiving the submitter's comments, ERCOT shall then have up to 30 days to reconsider and, if

- appropriate, revise their recommendation and provide a revised written report to the submitter.
- (2) At any time during the process of resolving the request, the submitter may withdraw the request. If the submitter withdraws the request, they retain the right to amend and/or resubmit the request at a later date.

### ***12.9.3 Presentation to Profiling Working Group***

- (1) When ERCOT has completed their recommendation following the steps outlined in the above two sections, they shall post the request and evaluation report to the ERCOT website. They shall also notify the Profiling Working Group (PWG) chair, who shall schedule time on the PWG agenda at the next available opportunity for the submitter and ERCOT to formally present the request and recommendations.
- (2) ERCOT may also recommend other actions, such as a modified definition of the proposed segment or other affected Load Profile Segments. ERCOT's evaluation of a change request may be conducted in conjunction with analysis of other requests and/or other criteria specified in Section 12.4, Process Timing for Requesting Changes. Recommendations may be made jointly for more than one affected request and existing Load Profile Segments.
- (3) ERCOT shall also recommend to the PWG whether the requested Load Profile Segment should be settled using a Load Profile from an adjusted static model or from a lagged dynamic sample Load Profile Segment. The recommendation shall be based on the supporting data submitted with the request and on ERCOT judgment regarding the appropriateness of either methodology.
- (4) If a request has been granted conditional approval, following the completion of the Load research sampling and analysis, ERCOT shall also reconsider the recommendation regarding Settlement methodology for the new Load Profile Segment made at the time the conditional approval was granted. If, based on the reconsideration ERCOT concludes that an alternate profiling methodology should be applied, they shall make a recommendation to the PWG detailing the reasons for recommending the change.

### ***12.9.4 Profiling Working Group Disposition of Request***

- (1) Following the presentation referenced in Section 12.9.3, Presentation to Profiling Working Group, the PWG shall prepare a recommendation on the action that should be taken with respect to the request. Possible recommended actions include:
  - (a) No change to existing Load Profile Segments;



- (b) Conditional approval of a new Load Profile Segment for a requested group;
  - (c) Creation of a new Load Profile Segment for a requested group, with no changes to other existing Load Profile Segments;
  - (d) Creation of a new Load Profile Segment for a requested group, with adjustments made to one or more other affected Load Profile Segments;
  - (e) Redefinition of an existing Load Profile Segment to include the requested group, with no change to the existing Load Profile Segment or to any other Load Profile Segment; and
  - (f) Redefinition of an existing Load Profile Segment to include the requested group, with adjustments made to one or more affected Load Profile Segments.
- (2) If the request is granted conditional approval and the requestor agrees, ERCOT shall implement the specified Load research sampling and analysis and report to the originator and the PWG on the findings with respect to the criteria specified. Provided the request for conditional approval has received the appropriate ERCOT committee approval and if, in the judgment of ERCOT, the criteria are met, the request shall be granted final approval; if the criteria are not met the request shall be denied.
- (3) Creation of a new Load Profile Segment or redefinition of an existing Load Profile Segment to include a requested group may require modification of existing affected Load Profile Segments. Whether or not an adjustment to existing Load Profile Segment is recommended shall depend on the magnitude of the difference in the existing Load Profile Segment implied by removal or addition of the segment, as well as the cumulative effects of multiple such removals and additions.
- (4) The PWG recommendation regarding the disposition of the request(s) shall be presented to the Commercial Operations Subcommittee (COPS) and then, if approved, be forwarded to the Technical Advisory Committee (TAC) for further disposition.
- (5) If the PWG is considering a recommendation from ERCOT to change the Load Profiling Methodology to be applied to a conditionally approved new Load Profile Segment, the PWG shall make a recommendation to COPS regarding the methodology change. The methodology change, if approved by COPS, shall be forwarded to TAC for further disposition. The ultimate disposition of any such methodology change shall have no bearing on the granting of final approval for the Load Profile Segment change request.

**ERCOT Load Profiling Guide**  
**Section 13: Changes to Weather Zone Definitions**

**October 1, 2010**

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## **13 CHANGES TO WEATHER ZONE DEFINITIONS**

- (1) Changes to Weather Zones and any combination thereof that may be requested include:
  - (a) Changes in Weather Zone boundary definitions;
  - (b) Changes in the boundaries of weather modeling regions;
  - (c) Changes in the weather stations used; and
  - (d) Changes in the weighting of weather stations used within a Weather Zone.
- (2) Any change to Load Profile ID assignments resulting from an approved modification to the definitions of Weather Zones shall not be retroactively applied.
- (3) A requested Weather Zone change shall be shown in the supporting documentation to be different from the existing Weather Zone definitions in ways that improve the accuracy of Settlement.

### **13.1 General Guidelines for Weather Zone Changes**

#### ***13.1.1 Timeline for Processing a Request***

Timing of requests, responses to requests, and change implementation shall be as defined for Segmentation in Section 12.4, Process Timing for Requesting Changes.

#### ***13.1.2 Uniformity***

Weather Zone definitions shall be applied to all Electric Service Identifiers (ESI IDs) located within the geographic boundaries of the Weather Zone. Zone Improvement Plan (ZIP) codes are mapped to Weather Zones and are defined by the ZIP-to-Zone mapping in the Appendix D, Profile Decision Tree.

### **13.2 Changes to Weather Zone Boundaries**

#### ***13.2.1 Types of Weather Zone Boundary Changes***

- (1) Changes to Weather Zone boundaries and any combination thereof, may occur due to the following conditions:
  - (a) **Subdivision:** An existing Weather Zone is divided into two or more zones;

- (b) Boundary shifting: Existing Weather Zone boundaries are moved so that areas are shifted between Weather Zones; and
  - (c) Boundary collapsing: Existing Weather Zone boundaries are moved so that one Weather Zone is created from two or more existing Weather Zones.
- (2) When creating a new Weather Zone, the other zones affected by the boundary change shall satisfy the Weather Zone criteria in Section 13.2.2, Eligible Areas for Weather Zones.
- (3) Boundary shift considerations:
- (a) A shift *within* a modeling region is a boundary shift where all zones affected by the shift have the same zone constants; and
  - (b) A shift *across* modeling regions is a boundary shift where zone constants are different between areas affected by the shift.
- (4) A shift across modeling regions is more complex to implement. A subdivision of a Weather Zone is similar to a shift within a modeling region. Therefore, all Weather Zones affected by the Weather Zone subdivision have the same zone constants.

### **13.2.2 Eligible Areas for Weather Zones**

Each Weather Zone that results from a requested Weather Zone boundary change shall be a geographically contiguous area defined by identifiable physical, Transmission and/or Distribution Service Provider (TDSP) territory, or ZIP code boundaries.

#### **13.2.2.1 Size**

The requested Weather Zone changes shall be shown in supporting documentation to be of sufficient size, both in number of Customers and in total energy consumption, to justify the changes. While no explicit size threshold is set, the size of each proposed new or changed Weather Zone shall be considered in evaluating a Weather Zone change request.

#### **13.2.2.2 Weather Stations**

- (1) Only weather data from National Oceanic and Atmospheric Administration (NOAA) first or second order weather stations shall be used in model calculations. Each proposed new or changed weather station shall have at least two NOAA first or second order weather stations to represent it.

- (2) The change request shall propose the weights to be used for the weather stations in each Weather Zone to be created or changed. No weather station is permitted to have more than 50% weight.

### **13.2.3 Supporting Data**

A requested new Weather Zone created by subdividing an existing Weather Zone shall be different from the current Weather Zone assignment. For requests of any boundary shift, the shifted area shall be different from the currently assigned Weather Zone and more similar to the proposed Weather Zone. In each case, the difference (or similarity) shall be shown to result in important differences (or lack of important differences) in Load Profiles. Important differences are those that materially affect the accuracy of Settlement.

#### **13.2.3.1 Calculated Load Profiles**

- (1) Load Profile calculations should be provided on current Weather Zone definitions and proposed Weather Zone definitions. The results of the change(s) should be significant enough to justify the proposed Weather Zone.
  - (a) For a subdivision or a shift within a weather-modeling region, Load Profiles shall be calculated using the existing zone constants;
    - (i) In the case of a subdivision, the Load Profiles for one or more of the new zones created by subdivision shall be different from the current set of profiles;
    - (ii) In the case of a boundary shift or collapsing, the Load Profiles for the shifted area shall be different from those from the current assignment and more similar to those of the proposed new assignment.
  - (b) For a shift across modeling regions, the following calculated Load Profiles shall be provided for each shifted area:
    - (i) Load Profiles calculated using the zone constants of the currently assigned zone:
      - (A) Using the weighted average for the current Weather Zone;
      - (B) Using the weighted average weather of the current zone after the shifted area is removed, with the proposed weights;
      - (C) Using the weather of the shifted area only.

- (ii) Load Profiles calculated using the zone constants of the receiving zone, to which the shifted area is proposed to be moved:
  - (A) Using the weighted average for the receiving Weather Zone;
  - (B) Using the weighted average weather of the receiving zone after the shifted area is added, with the proposed weights;
  - (C) Using the weather of the shifted area only.
- (2) The Load Profile using the weather for the shifted area and its current assigned zone constants shall be different from the other two Load Profiles calculated with the current zone constants for the area. The Load Profile developed by the weather of the shifted area and the zone constants of the receiving zone shall be similar to those of the other Load Profiles calculated with the zone constants of the current zone. Differences of an area from its current zone and similarity of an area to a proposed receiving zone shall be assessed using the measures described in Appendix C, Measuring Differences Between Load Profiles.

#### **13.2.3.2 Additional Supporting Data for Shifts across Weather Modeling Regions**

- (1) For a shift across weather modeling regions, evidence shall be provided that demonstrates the weather response of the affected area is likely to be more similar to the proposed new region than to the currently assigned region. The types of evidence that may be offered for this purpose are the same as those types described in Section 12, Request for Profile Segment Changes, Additions, or Removals, and include:
  - (a) Load research data from the affected area, from the current Weather Zone excluding the affected area, and from the proposed receiving Weather Zone;
  - (b) Equipment operating data from each area;
  - (c) End-use equipment saturation data from each area; and
  - (d) Monthly consumption patterns from each area.
- (2) Based on the supporting data, the request shall indicate whether the zone constant(s) should be re-estimated.

### **13.2.3.3 Basis for Assessing Differences**

The difference in Load Profiles based on the proposed versus current Weather Zones shall be assessed similarly to an assessment of a new versus existing Load Profile Segment, by consideration of the same types of factors as described under Section 12.6.2, Difference from Current Load Profile Segments. Only those Load Profile Models dependent on weather variables shall be used in the assessment of a Weather Zone change.

## **13.3 Changes to Weather Modeling Regions**

A weather modeling region boundary shall be changed if shifting an area across weather modeling regions changes a Weather Zone boundary. In some cases ERCOT and the Profiling Working Group (PWG) may recommend retaining current zone constants even though they shall be applied to a region different from the one for which the estimation was conducted.

### ***13.3.1 Supporting Data Required***

- (1) Any requested change to weather modeling regions shall be treated as a special case of a request for a change in Load Profile Segment definitions. Supporting data required for such a request is described in Section 12.6, Information Required with Request for Change. Specific supporting information required for a request to shift a Weather Zone boundary across weather modeling regions is described in Section 13.2.3, Supporting Data. Corresponding information is required for other changes to weather modeling regions.
- (2) The requested Weather Zone shall be different from the current Weather Zone in ways that improve Load Profiles. A change in Weather Zone requiring new coefficients for the new zone shall be considered as a special case of a request for a new Weather Zone segment. Procedures for submitting and assessing requests are the same as the rules for requesting a change in Segmentation, as described in Section 12, Requests for Load Profile Segment Changes, Additions, or Removals. The assessment shall include the effect on the rest of the Weather Zone(s) of changing this area's coefficients.

### ***13.3.2 Basis for Assessing a Request***

ERCOT shall assess the request based on the data and analysis submitted with the request as well as possible additional analysis by ERCOT. Factors considered in assessing any request may include:

- (a) The quality of the supporting data provided;
- (b) The magnitude of differences indicated;



- (c) The size of the affected populations;
- (d) The complexity of the change required;
- (e) The effect on other Weather Zone(s) and other weather modeling regions if the change is accepted;
- (f) The effect on ERCOT systems; and
- (g) The enhancement of settlement accuracy.

## **13.4 Changing Weather Stations**

### ***13.4.1 Requests for Changes***

- (1) A request may be made to change the weights assigned to weather stations within a Weather Zone. Such a change would include adding a weather station that was not previously used, or deleting a station currently used. Changing weather stations may require re-estimation of zone constants for weather modeling regions and model-based Load Profile Types.
- (2) A request for such a change shall be accompanied by evidence that the proposed new set of stations and weights are more representative of the population in each affected Weather Zone than the current ones. An example of such evidence would be analysis of the distribution of population and Weather Zone patterns similar to that conducted for the initial development of the weather modeling procedures. However, given the broad implications of changing the weather stations, the evidence shall also prove to be a substantial benefit to current specifications.

## **13.5 Weather Zone Definition or Modeling Region Changes without a Change Request**

### ***13.5.1 Periodic Assessment***

ERCOT may assess Weather Zone and weather modeling region boundaries in its periodic process of evaluating Load Profile Models. In the event that ERCOT conducts such an assessment and determines that weather modeling boundaries shall be re-drawn, new zone constants may be estimated for all affected Weather Zones. ERCOT shall present its proposed changes to the Profiling Working Group (PWG) for evaluation and implementation according to the procedures contained herein.

## ***13.5.2 Changes Required Based on Changing Data Availability***

### **13.5.2.1 Changes in National Oceanic and Atmospheric Administration Weather Station**

Weather station changes shall be necessary in the event that a station currently used is discontinued by National Oceanic and Atmospheric Administration (NOAA) or changed by downgrading from second order status. In the event that NOAA makes such changes, ERCOT shall assess and propose reasonable adjustments.

### **13.5.2.2 Changes in Zone Improvement Plan Codes**

- (1) ERCOT's Load Profiling Weather Zones are defined by the five digit ZIP codes. ZIP code changes within a current Weather Zone shall not require any special adjustments. The new ZIP code definitions shall be incorporated into profiling systems so that Electric Service Identifiers (ESI IDs) shall continue to be correctly assigned.
- (2) ZIP code changes that affect a Weather Zone boundary shall be incorporated into Weather Zone definitions with minimal change in definitions and assignments. When a ZIP code overlaps two or more Weather Zones, the entire new ZIP code shall be assessed for the proper Weather Zone assignment. A ZIP code shall be completely contained within only one Weather Zone.

**ERCOT Load Profiling Guide**  
**Section 14: Load Profile ID Dispute Procedure**

October 1, 2010

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## 14 LOAD PROFILE ID DISPUTE PROCEDURE

ERCOT and Market Participants shall adhere to this procedure for disputing Load Profile ID assignments.

### 14.1 Filing of a Load Profile ID Dispute

ERCOT and any Market Participant, other than a retail Customer, may file disputes related to Load Profile ID assignments. Retail Customers with disputes, related to Load Profile ID assignments, shall first request resolution from their Competitive Retailers (CRs). The CR shall address the Customer's issue, and if necessary, request changes or corrections from ERCOT related to the retail Customer's request. A retail Customer who is not satisfied with the CR's response may appeal to the Public Utility Commission of Texas (PUCT) or the appropriate regulatory authority. ERCOT does not resolve such disputes.

### 14.2 General Load Profile ID Dispute Resolution Guidelines

Transmission and/or Distribution Service Providers (TDSPs) and ERCOT share responsibility for the assignment of Load Profile IDs. Competitive Retailers (CRs) may request a Load Profile ID assignment change as a dispute of an existing Load Profile ID assignment. Requested changes to remove an Electric Service Identifier (ESI ID) from a default Load Profile ID should only be made after adequate monthly data becomes available.

#### 14.2.1 *Disputes Involving ERCOT*

- (1) Disputes involving ERCOT should be submitted using the MarkeTrak system for any of the following cases:
  - (a) Requests to remove an ESI ID from a default Load Profile ID - such requests should only be made after adequate monthly data becomes available;
  - (b) Disputes regarding ERCOT calculations made as a part of Annual Validation; and
  - (c) Disputes regarding ERCOT calculations relating to the weather sensitivity code.
- (2) ERCOT is responsible for all disputes defined in this Section all Profile Decision Tree versions, and all Annual Validation years.

### ***14.2.2 Disputes Involving Transmission and/or Distribution Service Providers***

All disputes related to Load Profile ID assignments other than those described in the preceding section must be addressed with each TDSP in accordance with their individual processes.

### ***14.2.3 Alternative Dispute Resolution***

If attempts to clarify or resolve the issue using one of the processes listed above are unsuccessful, parties should refer to Protocol Section 20, Alternative Dispute Resolution Procedure.

## **14.3 Resolutions of Disputes**

When the resolution of a dispute requires a change in a Load Profile ID assignment, the change shall be implemented by the Transmission and/or Distribution Service Provider (TDSP) issuing the appropriate Texas Standard Electronic Transaction (TX SET).

**ERCOT Load Profiling Guide**  
**Section 15: Load Research Samples**

April 1, 2011

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## 15 LOAD RESEARCH SAMPLES

- (1) Load research samples are required by ERCOT as the basis for developing and evaluating Load Profiles for most Load Profile Types. Protocol Section 18.2.10, Responsibilities for Sampling in Support of Load Profiling, broadly defines the responsibilities of ERCOT and Transmission and/or Distribution Service Providers (TDSPs) regarding Load research samples. This part of the Load Profiling Guide (LPG) also provides guidelines on communication and expectations between ERCOT and TDSPs in fulfilling those responsibilities.
- (2) TDSPs have provided their Load research data in the past and shall continue to provide available data in the future in the interest of keeping ERCOT's costs down. TDSPs may, at their own discretion, determine the overall level of Load research effort they will provide. TDSP's Load research is independent of ERCOT, except as specified in Protocol Section 18, Load Profiling. ERCOT shall make use of TDSP and Non-Opt-In Entity (NOIE) Load research data to the extent such data are available and useful. ERCOT shall attempt to minimize the burden to TDSPs of providing data to ERCOT.
- (3) TDSPs and NOIEs provided all Load research data to ERCOT used in the initial development of Load Profiles. ERCOT may periodically request current Load research data from all TDSPs and NOIEs for Load Profile Model evaluations. Additional Load Research Sampling information can be found on the Load Profiling page on the ERCOT website.

### 15.1 Transmission and/or Distribution Service Provider Samples

#### 15.1.1 Maintenance of Existing Samples

- (1) Transmission and/or Distribution Service Providers (TDSPs) with current Load research samples are required by Protocol Section 18.2, Methodology, to maintain these samples to the accuracy designed. Maintaining accuracy means that as long as the sample is deployed, the TDSP is responsible for performing the following:
  - (a) Replacing sample points as needed to compensate for sample attrition;
  - (b) Replacing or repairing malfunctioning data collection equipment as needed;
  - (c) Maintaining and operating data collection and processing systems; and
  - (d) Providing annual reports to ERCOT as described in Section 15.1.2, Notification to ERCOT.
- (2) Subject to the one year notification requirement in Section 15.1.2, a TDSP may discontinue any sample at its own discretion.

## **15.1.2 Notification to ERCOT**

### **15.1.2.1 Types of Changes Given Advance Notice**

- (1) For any major change to the design of a sample, the TDSP shall provide ERCOT with at least one year advance notice. In particular, this amount of advance notice shall be given for taking an existing sample out of the field.
- (2) TDSPs shall also provide one year advance notice, whenever practical, for any of the following changes:
  - (a) Putting a new sample into the field;
  - (b) Rotating a sample by systematically replacing a subset of the current sample with new sample points;
  - (c) Adding supplemental strata to account for new accounts added to the population of the class;
  - (d) Bulk replacement of equipment or data collection systems with new types of equipment or systems; and
  - (e) Other major changes to the Sample Design or implementation.
- (3) Notification to ERCOT is not intended to be a barrier to developing and implementing changes within less than a year. If a TDSP determines a need to implement any of the above changes on a shorter timetable, the TDSP may do so at its own discretion, but shall notify ERCOT of its plans as soon as practical. The sole exception is that a TDSP shall not discontinue an existing Load research sample with less than one year notice to ERCOT.
- (4) Changes involving routine sample maintenance, including replacement of dropped points or replacement or repair of problem equipment, do not require case-by-case notification to ERCOT.

### **15.1.2.2 General Reporting Procedures**

- (1) Each TDSP shall report to ERCOT by April 1st of each year the status of its Load research samples and future plans for these samples in addition to providing the Load research data. The annual report on sample status shall include the information on each existing Load research sample as well as on any plans for new Load research samples.
- (2) TDSPs shall update ERCOT with a report by September 1st of each year regarding any major changes to samples planned for the next 12 months.

- (3) ERCOT shall ordinarily request data for each Load research sample once a year, on the schedule indicated above. For new samples, requests may be made more frequently, enabling ERCOT to begin using the data before a full year of data is available. ERCOT may also request data more frequently in special cases (e.g., Public Utility Commission of Texas (PUCT) mandate). TDSPs shall provide requested data to ERCOT within 60 days.
- (4) Load research data shall be provided by the TDSP both at the individual Premise level and aggregated to TDSP class estimates. The Load data and status codes delivered shall be in edited and validated form.
- (5) Specific required and desired information for each report is described below. Where information is specified for each TDSP class Load research sample, the information shall be provided for each Load research sample that existed as of the last reporting period, as well as for all current Load research samples. If a new sample shall be placed for a class that does not currently have one, this information should be provided as part of item (1)(f) of the following Section 15.1.2.3, Required Information.

### **15.1.2.3 Required Information**

- (1) The following information is required as part of the annual reporting and data transmittal.
  - (a) Included as fields in the data files provided:
    - (i) Data quality flags;
    - (ii) Sample expansion weights; and
    - (iii) Stratum identifiers.
  - (b) A data dictionary providing the file layout(s) and codebook.
  - (c) For each class sample, a description of the Sample Design, stratification, procedure for calculating expansion weights, and data validation procedures.
  - (d) For each stratum in each sample:
    - (i) The original and current sample sizes; and
    - (ii) The original population number of Customers and annual energy in MWh.

- (e) For each class sample, the most recent available estimates of annual peak Load and whatever accuracy measures have been calculated for that estimate.
    - (i) The date for which the analysis was conducted and the year when the analysis was completed shall also be reported; and
    - (ii) If the Sample Design was based on accuracy criteria, other than annual peak Demand, a description of these criteria with the corresponding most recent estimates and accuracy measures and dates of these analyses shall be provided.
  - (f) Plans for any major changes as described in Section 15.1.2, Notification to ERCOT, planned for the next 12 months.
    - (i) The type of change planned; and
    - (ii) The anticipated schedule.
  - (g) Description of major changes during the preceding 12 months. Major changes include the items under Section 15.1.2.1, Types of Changes Given Advance Notice. For each change the TDSP shall indicate:
    - (i) The type of changes made; and
    - (ii) The timing of the changes.
- (2) Items (1)(a) through (1)(e) do not have to be re-submitted, if they have not changed since prior reports to ERCOT. The report shall note that these items were previously submitted and have not changed. Items (1)(f) and (1)(g) are required only with the regular (April and September) status reports, not as part of periodic reporting in response to special requests.

#### **15.1.2.4 Additional Requested Information**

- (1) The following additional items are useful to ERCOT for analysis. TDSPs should provide as much of this or related information as practical given their current practices and operations.
  - (a) For each stratum in the sample:
    - (i) The number of points removed and added in the past year, excluding direct replacements; and
    - (ii) The fraction of intervals with missing or bad data.
  - (b) For each class sample:

- (i) Distributions of energy; and
  - (ii) Definitions of rate classes (TDSP tariffs) that the samples are applicable to along with the rate classes that the samples are assigned to.
- (c) Description of sample coverage:
- (i) Give Customer counts and annual energy for the portion of the population that is not represented by any of the samples;
  - (ii) This information may be provided as a single total for each category or by identifying and quantifying specific subgroups that were not included in any of the sample frames; and
  - (iii) Provide this information separately by Residential and Business categories.
- (2) ERCOT shall provide a standard reporting format for TDSP use for reporting on Load research.

### ***15.1.3 Availability of Data***

Load research data provided to ERCOT from the TDSP shall only be available to ERCOT for its use in Load Profiling.

### ***15.1.4 Creation of New Transmission and/or Distribution Service Provider Samples***

- (1) A TDSP may, at its discretion, develop new Load research samples. These samples may be a replacement for existing samples or may represent a population not currently covered by an active Load research sample.
- (2) A TDSP that develops a new Load research sample shall inform ERCOT of the plan to develop the sample. This information shall be provided as part of the reporting procedures described in Section 15.1.2, Notification to ERCOT. Information the TDSP shall provide about a planned new sample shall include:
- (a) A description of the population to be represented by the sample;
  - (b) The relationship between this population and classes represented by current samples or previously existing samples for which data have been provided to ERCOT; and
  - (c) The approximate size of the population, in number of Customers and MWh.

- (3) When plans for a new sample are sufficiently developed, the TDSP shall provide in its report to ERCOT a description of the Sample Design. This description shall include:
- (a) The Sample Design accuracy target;
  - (b) The estimation method for which the sample accuracy is designed (typically, mean-per-unit or ratio estimation);
  - (c) The stratification scheme;
  - (d) The population size of each Sampling cell in number of Customers and annual MWh; and
  - (e) The sample size of each Sampling cell.

## 15.2 ERCOT Samples

According to Protocol Section 18.2.10, Responsibilities for Sampling in Support of Load Profiling, ERCOT is responsible for developing new Load research samples if it determines that existing Load research data are insufficient for profile development and maintenance. ERCOT or its designated agent shall develop Sample Designs, select samples, install metering equipment, collect, process, and validate data, and develop population estimates. ERCOT shall be responsible for the costs associated with the Sampling functions it directs. ERCOT shall adhere to good professional practice in all these functions. ERCOT shall utilize the Association of Edison Illuminating Companies (AEIC) *Load Research Manual* as a reference for standards of good practice.

### 15.2.1 Maintenance

As long as an ERCOT Load research sample is in the field, ERCOT shall maintain the sample to good standards. Sample maintenance shall include the following:

- (a) Replace sample points as needed to compensate for sample attrition;
- (b) Replace or repair malfunctioning data collection equipment as needed;
- (c) Review incoming data on at least a monthly basis to identify problems of high rates of missing data, or anomalous values;
- (d) Repair or correct apparent equipment or system malfunctions on a timely basis; and
- (e) At least once a year, calculate class means for each class Load research sample, using the estimation procedure appropriate to the Sample Design, and calculate the accuracy of the estimated peak Load. If criteria other than accuracy of Load at peak were used in designing the sample,

calculate these accuracy measures. If the sample no longer meets the design accuracy criteria, initiate steps to bring the sample into conformance with the design criteria.

### **15.2.2 Availability of Data**

- (1) Load research data collected by ERCOT shall be available only to ERCOT or its designated agent. Load Profiles developed from these data shall be made available through ERCOT's standard profile reporting procedures. ERCOT shall provide descriptive information available on Load research samples, in support of Load Profiling, according to Protocol Section 18.3.1, Methodology Information. This data is strictly used for Load Profiling purposes.
- (2) In addition to the published Load Profiles, other aggregate data from the Load research samples shall also be made available to Market Participants by ERCOT. Aggregate data that ERCOT shall provide for each Load research sample shall include:
  - (a) ERCOT's estimate of average kW per Electric Service Identifier (ESI ID) in each time interval based on the Load research sample;
  - (b) Standard errors or other statistical accuracy measures for the estimated average kW per ESI ID in each interval; and
  - (c) Sample Size.
- (3) The standard errors and sample sizes for each Load research sample may be provided as ranges or averages rather than providing individual values for each time interval. ERCOT may provide additional aggregate information that it deems to be of value to the Market Participants.

### **15.2.3 Criteria of Standards**

- (1) Load research samples developed by ERCOT shall be designed to meet a standard of  $\pm 10\%$  accuracy at 90% confidence. A discussion of the meaning of accuracy measures and procedures is in the *AEIC Load Research Manual*.
- (2) For Load research samples used for universally applicable Load Profiles, this accuracy standard shall be applied at the level of each Load Profile Segment definition. It is preferred that this accuracy standard should be achieved at the level of a distinct Load Profile Segment and weather modeling region. Universally applicable Load Profiles are defined in Section 12, Requests for Load Profile Segment Changes, Additions, or Removals. Weather modeling region is defined in Section 13, Changes to Weather Zone Definitions.

- (3) Designing a sample to meet a particular accuracy standard requires information about the population, including the number and total Load by subgroup, and the variability in Load across the group. Such information is typically not available before the data have been collected. It is therefore standard practice to design samples initially using proxy measures.
- (4) Prior to collecting data for the designated population, the Sample Design shall be developed using characteristics from the Load research data already compiled by ERCOT. After a year of data has been collected, ERCOT shall review the achieved accuracy of the samples. If the achieved accuracy is worse than the design target, ERCOT shall consider increasing sample sizes or modifying the design to achieve the target accuracy. For any such re-design efforts, the data from the current sample shall be used as the basis for estimating the population parameters needed to calculate sample requirements.
- (5) In reviewing the achieved accuracy of the initial Load research samples, ERCOT shall consider these possible metrics as well as conformance to the design accuracy standard:
  - (a) Accuracy of the fraction of energy allocated into each of several Time Of Use (TOU) periods (several being about four time periods);
  - (b) Accuracy of the ratio of on-peak to off-peak consumption;
  - (c) Demand at the peak hour in each month;
  - (d) Total energy consumption in each month; and
  - (e) Accuracy of Load-weighted average price, using a standard price series.
- (6) Based on this review, ERCOT may recommend new standards based on one or more of these metrics for future Load research samples.

#### **15.2.4 Creation of New Samples**

- (1) ERCOT has the authority to determine the need for new Load research samples. These samples may be a replacement for existing samples, or may represent a population not currently covered by an active Load research sample.
- (2) Samples developed by ERCOT may be regional spanning more than one TDSP. The sampled populations may also be restricted to only a geographic subset of a TDSP's service territory.
- (3) Information that ERCOT shall provide to the Profiling Working Group (PWG) about a planned new sample shall include:
  - (a) A description of the population to be represented by the sample;



- (b) The relationship between this population and classes represented by current samples or previously existing samples for which data have been provided to ERCOT; and
  - (c) The approximate size of the population, in number of Customers and MWh.
- (4) When plans for a new sample are sufficiently developed, ERCOT shall provide to the PWG a description of the Sample Design. This description shall include:
- (a) The Sample Design accuracy target;
  - (b) The estimation method for which the sample accuracy is designed (typically, mean-per-unit or ratio estimation);
  - (c) The stratification scheme;
  - (d) The population size of each Sampling cell in number of Customers and annual MWh; and
  - (e) The Sample Size of each Sampling cell.

#### ***15.2.5 Guidelines for Installing and Refreshing Load Research Samples***

The decision to develop a new Load research sample shall be based on ERCOT's annual evaluation of models and methods. This evaluation process is described in Section 8, Load Profile Models, and Section 7, Request for Changes to Load Profiling Methodology. Circumstances that may trigger ERCOT's decision to field a new Load research sample might include the following:

- (a) Indications that existing Load Profile Models do not perform well in areas that do not have recent Load research data. Such indications could include:
  - (i) Load Profiles whose monthly fractions are very different from those observed in monthly billing data for a particular area;
  - (ii) Systematically high Unaccounted for Energy (UFE) for a particular area; and
  - (iii) Other indicators that the equipment present or operating patterns are very different in a particular area from that for Load research data were available.
- (b) Reported plans by a TDSP to discontinue collecting Load research data for particular samples.

- (c) Determination that too much time has elapsed since the Load research data on which current models are based were collected.
- (d) Determination that current Load research samples do not meet accuracy standards for a particular population segment.

**ERCOT Load Profiling Guide**  
**Section 16: Supplemental Load Profiling**

**October 1, 2010**

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## 16 SUPPLEMENTAL LOAD PROFILING

- (1) Protocol Section 18.7, Supplemental Load Profiling, requires that supplemental Load Profiles be developed for programs or pricing schemes that encourage a Demand Response (DR) to price in the retail market. A DR program is designed to alter Load shape. For such programs, methods other than Adjusted Static Methodology are necessary. The supplemental Load Profiling Methodologies described in this Section of the Load Profiling Guide (LPG) are intended only for DR programs or pricing schemes. Use of these methodologies for other applications requires approval of the Technical Advisory Committee (TAC).
- (2) The ERCOT Protocols allow Premises with Time Of Use (TOU) capable meters to be settled by a profiling method known as chunking, which is described below in Section 16.1.2, Chunking Profiling Methodology Description. Only those Premises with TOU metered energy can utilize this capability. The Protocols require that Direct Load Control (DLC) programs shall be profiled using Representative Interval Data Recorder (RIDR) profiles based on statistically representative Load research samples (Protocol Section 18.7.2, Other Load Profiling). Other supplemental profiles (Protocol Section 18.7.2) are limited to segments that are subject to pricing schemes designed to encourage DR. The appropriate methodology for other supplemental profiling shall be determined based on the characteristics of the DR program.

### 16.1 Load Profiling for Time Of Use Schedules

- (1) All Competitive Retailers (CRs) have the right to offer Time Of Use (TOU) Schedules (TOUSs) in all Transmission and/or Distribution Service Provider (TDSP) service territories, subject to the following restrictions (reference Protocol Section 18.7.1, Load Profiling of Time of Use Metered Electric Service Identifier):
  - (a) Within each TDSP service territory, a CR may offer only TOUSs that are listed in Appendix D, Profile Decision Tree; and
  - (b) Implementation of any new TOUS is subject to the ERCOT and Texas Standard Electronic Transaction (TX SET) change control process.
- (2) The right to use TOUSs, subject to restrictions in items (1)(a) and (1)(b) above, applies in both investor-owned TDSP service territories, in Non-Opt-In Entities (NOIEs) territories if they opt in, and in any new TDSP territories. For purposes of TOUS management, all TOUSs for NOIE or TDSP territories that opt into the market shall be considered new TOUS and therefore subject to the new TOUSs process in Section 16.1.1, Establishing New Time Of Use Schedules.

### **16.1.1 *Establishing New Time Of Use Schedules***

- (1) Available TOUSs are listed in Appendix D, Profile Decision Tree. Any request for a new TOUS shall be submitted as a Load Profiling Guide Revision Request (LPGRR) in accordance with the process set forth in Section 2, Load Profiling Guide Revision Process.
- (2) Currently, the ERCOT Settlement system can only accommodate TOUSs that have up to four TOU periods (e.g., off-peak, mid-peak, on-peak, super-peak). Requests for new TOUSs that have four or less buckets can be implemented in ERCOT systems within seven Business Days of approval. Requests for TOUSs with more than these four buckets will require significant system changes and will subject the LPGRR requesting the new TOUSs to the project prioritization process within ERCOT to determine their ERCOT implementation time.
- (3) Since TOUSs also impact TDSP systems and these systems vary in their ability to support these TOUSs, ERCOT and the Profiling Working Group (PWG) will coordinate closely with TDSP(s) impacted by a new proposed TOUS. Each impacted TDSP will be requested to submit comments to the proposed LPGRR regarding the system impacts and time frame required to implement the requested TOUS. The PWG will incorporate this time frame in the expected implementation date for the LPGRR.
- (4) ERCOT shall issue a market notice once the new TOUS has been incorporated into ERCOT systems, and also once the affected TDSPs have implemented the new TOUS and notified ERCOT by sending an email to [ERCOTLoadProfilingDepartment@ercot.com](mailto:ERCOTLoadProfilingDepartment@ercot.com) that the TOUS is ready. At this point CRs may begin to request that the TOU meters be installed.

### **16.1.2 *Chunking Load Profiling Methodology Description***

The chunking method of Load Profiling for TOU Customers means that a standard Load Profile is applied to the Customer's consumption data for a meter reading period. However, the energy for each TOU period in the Load Profile is scaled so that it is equal to the metered energy (kWh) for the TOU period. For each TOU period within a meter read cycle, the metered consumption during the TOU period is allocated to time intervals within the TOU period in proportion to the Load Profile level at each interval in that period.

### **16.1.3 *Evaluation of the Chunking Load Profiles***

- (1) Load Profiles that are adjusted by chunking shall be evaluated as part of the general evaluation procedures described in Section 6, Load Profiling Methodology, and Section 8, Load Profile Models. Evaluation of the effects of chunking shall be included in the assessment of Unaccounted for Energy (UFE) described in Section 8.3, Evaluating Load Profile Models without Current Load

- Research Data. If Load research data is available for a sample of TOU Customers, this data could also be used in the evaluation using methods discussed in Section 8.3.
- (2) Additional procedures that may be used to assess the adequacy of chunking include the following:
- (a) Assess chunking as a general method based on Load Profiles from other areas;
  - (b) Assess chunking using Load research data collected in the ERCOT service territory; and
  - (c) Assess chunking using data on Customer characteristics in the ERCOT service territory.

#### **16.1.3.1 Assessment of Chunking as a General Method Based on Load Profiles from Other Areas**

- (1) This assessment evaluates chunking as a general methodology, not necessarily specific to particular ERCOT Load Profiles. Such an assessment could be conducted using Load Profiles from another source service area. To be used in this analysis, the source service area shall have separate Load Profiles based on separate Load research samples for a TOU class and a corresponding Non-Time Of Use (NOTOU) class.
- (2) The assessment compares the source service area's TOU Load Profile based on the TOU sample to a chunked profile created by applying the chunking method to the source service area's corresponding profile. To create the chunked profile, the TOUS applicable from this TOU class in the source service area are used, with the chunking procedures described in Section 16.1.2, Chunking Load Profiling Methodology Description.
- (3) The two Load Profiles are compared using the comparison methods in Section 8, Load Profile Models. Referencing the terminology in Section 8, the first Load Profile, based on the actual Load research data from the TOU class, is treated as the proposed Load Profile. The second, chunked Load Profile is the existing Load Profile. That is, the second Load Profile is the Load Profile the existing ERCOT methodology would use for the TOU class, if these classes were in ERCOT.
- (4) Such comparisons may be made for several different TOU classes, with corresponding NOTOU classes, in different regions, depending on available Load Profiles from other areas. Substantial differences between the two Load Profiles for many of the classes studied would indicate problems with the general approach. Substantial similarities between the two Load Profiles for most classes would indicate that the general method is reasonable.

### **16.1.3.2 Assessment of the Chunking Method Using ERCOT Load Research Data**

- (1) This assessment relies on a limited ERCOT Load research sample to evaluate the TOU Load Profiles developed by chunking. The goal is to compare two Load Profiles - the existing TOU Load Profile developed by the chunking method to:
  - (a) The corresponding non-chunked Load Profile; and
  - (b) The profile for the same population of TOU Electric Service Identifiers (ESI IDs) developed from a Load research sample of that population.
- (2) For purposes of this assessment, ERCOT may implement a limited Load research sample from each ERCOT TOUS and segment to be studied. The Sampling criteria for each Profile Type and schedule do not have to adhere to the Sampling guidelines established in Section 15.2.3, Criteria of Standards, since these samples are not being used for Settlement purposes.
- (3) For each segment and TOUS sampled, ERCOT shall determine the average Load for each hour of the study period from the Load research sample data. This Load-research-based Profile shall then be compared to the existing chunked Load Profile, using the comparison methods in Section 8, Load Profile Models. Referencing the terminology in Section 8, the chunked Load Profile is the existing Load Profile, and the Load Profile developed from the Load research sample is the proposed Load Profile.
- (4) Substantial differences between the two Load Profiles for many of the classes studied would indicate problems with the general approach. Substantial similarities between the two Load Profiles for most classes would indicate that the general method is reasonable. The results might also indicate that the method is adequate for some classes but not for others.

### **16.1.3.3 Assessment of Chunking Method Based on Characteristics of the Time Of Use and Non Time Of Use Populations**

- (1) This assessment is less direct than the previous two assessment methods. The goal is to determine whether behavioral or operational differences between the TOU and NOTOU Customers are large enough to create substantial differences between the true Load shape for the TOU group and the chunked Load Profile.
- (2) For this assessment, ERCOT may examine data on appliance/equipment use patterns for ERCOT TOU and NOTOU Customers. Such data may be obtained from appliance saturation studies conducted by TDSPs, if available, or from a new survey conducted by ERCOT. If little difference is found between TOU and NOTOU Customers in the types of equipment in place and timing of its use, the chunking method may be considered adequate.



- (3) If substantial differences are found, ERCOT may develop rough adjustments to the NOTOU Load Profile that reflect these differences. Such adjustments would require estimated end-use Load shapes, which may be provided by TDSPs if available, or obtained from commercial databases.
- (4) The adjusted Load Profile would then be chunked to provide a new estimate of the TOU Load Profile. This new TOU Load Profile would then be compared with the original TOU Load Profile, using the comparison methods of Section 8, Load Profile Models.
- (5) Referencing the terminology in Section 8, the original chunked Load Profile is the existing Load Profile, and the new Load Profile developed from chunking the adjusted NOTOU Load Profile is the proposed Load Profile. However, this new Load Profile based on rough adjustments would not in fact replace the existing TOU Load Profile if substantial differences are found. Rather, these differences would be taken as an indication that the chunking method is inadequate for this segment.
- (6) Likewise, if substantial differences are found by this method for several segments, the chunking methodology as a whole may be questioned. Conversely, if several segments are examined and no substantial differences are found, the general chunking methodology is supported.

#### ***16.1.4 Revisions to Time Of Use Load Profile Methods if Changes Are Needed***

If the current chunking is determined to be an inadequate methodology for Load Profiling TOU Customers, the change to any other Load Profiling Methodology for these Customers would require the Technical Advisory Committee (TAC) approval in accordance with the Protocol Section 18.2, Methodology. The primary alternative that would be considered is lagged dynamic Load Profiling. Other alternatives may be proposed.

#### **16.2 Other Supplemental Load Profiles**

- (1) Other supplemental Load Profiles may be developed for other types of programs or pricing schemes that encourage a Demand Response (DR) to price in the retail market. The only supplemental Load Profiles permitted by ERCOT system functionality are Time Of Use (TOU).
- (2) Methodologies for any other supplemental Load Profile will be evaluated on a program by program basis. Procedures and requirements for developing these Load Profiles shall be the same as those described in Section 16.2, Direct Load Control, except where specified in Section 16.4, Requesting Direct Load Control or Other Supplemental Load Profile.

**ERCOT Load Profiling Guide**  
**Section 17: Load Profile Metering**

**December 1, 2010**

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## 17 LOAD PROFILE METERING

### 17.1 Introduction

- (1) This Section defines the requirements for metering with regard to Load Profiling and Interval Data Recorder (IDR) activities. Meter reading data in this context encompasses monthly consumption, Demand and interval meter data. The Transmission and/or Distribution Service Providers (TDSPs) are the only Entities authorized to provide Settlement meter data to ERCOT in accordance with Protocol Section 10, Metering.
- (2) Each Electric Service Identifier (ESI ID) in ERCOT shall be assigned to a Load Profile ID. Meter reading data is necessary to perform this assignment because the information used for assignment of the Load Profile ID is energy and/or Demand data. Only meter reading data provided to ERCOT shall be used to assign the Load Profile ID. The other primary uses of meter reading data are:
  - (a) To allocate daily Load for Settlement and aggregation process;
  - (b) To allow validation for Load Profile ID assignments;
  - (c) To ensure Load Profile Models are appropriately specified; and
  - (d) To allow for Load Profile Model development.
- (3) If an Advanced Meter is installed on a Customer's Premise and has the capability to function as an IDR or lower level metering, data shall be supplied to ERCOT in accordance with its intended purpose to meet the needs of ERCOT billing and Settlement activities.
- (4) This Section addresses the following topics:
  - (a) IDR requirement;
  - (b) Demand meter changes;
  - (c) Load research samples; and
  - (d) Supplemental Load Profiling.
- (5) Details for metering activities may be found in Protocol Section 10, Metering.

### 17.2 Interval Data Recorder Requirement

- (1) Interval Data Recorders (IDRs) shall be installed or removed in accordance with Protocol Section 18.6, Installation and Use of Interval Data Recorder Meters and

Retail Market Guide Section 7.13, Interval Data Recorder (IDR) Optional Removal/Installation Process.

- (2) Costs associated with mandatory installation of IDRs by Transmission and/or Distribution Service Providers (TDSPs) shall be the responsibility of the TDSP and be in accordance with approved TDSP tariffs.

### **17.3 Demand Meter Changes**

- (1) Section 9.2.1, Load Profile ID Changes Initiated by Transmission and/or Distribution Service Providers, presents the procedure for changing Load Profile ID assignment. The following provides brief discussion regarding the circumstances, which may involve a meter change.
- (2) When a Transmission and/or Distribution Service Providers (TDSP) determines that a Demand meter should be changed based on the TDSP metering tariff rules, the TDSP shall notify the Competitive Retailer (CR) prior to making the meter change. If the CR requires Demand data to support Customer billing for the Electric Service Identifier (ESI ID) in question, then the CR shall notify the TDSP of its requirement for Demand data. Upon CR notification, the TDSP shall not change the Demand meter.
- (3) If the Demand meter is no longer needed by TDSP tariff or CR billing requirements, the TDSP shall reassign the ESI ID to the appropriate Load Profile ID in accordance with Section 9.2, Processes to Change Load Profile ID Assignments. It is at the discretion of the TDSP whether to physically remove the Demand register/meter or perform a virtual meter change in their system. A virtual meter change means that no Demands shall be reported to ERCOT.
- (4) Conversely, the ESI ID's Load growth may warrant the measurement of Demand. TDSPs shall enforce appropriate thresholds and TDSP tariffs requiring the installation of a Demand meter.
- (5) Once it has been determined that a Demand meter change is warranted, the TDSP shall make appropriate changes in accordance with Protocol Section 18.4, Assignment of Load Profile ID. The TDSP shall notify the CR of the completed changes as well.
- (6) CRs may request the installation of a Demand meter for their Customers, regardless of TDSP thresholds, when required for application of the CR billing. The CR is responsible for any costs associated with the Demand meter installation and monthly meter reading in accordance with the approved TDSP tariffs.

#### **17.4 Load Research Samples**

- (1) Any Interval Data Recorders (IDRs) installed as part of the Load research program, i.e., in support of ERCOT Load Profiling or Transmission and/or Distribution Service Provider (TDSP) cost allocation/rate design, are not subject to the IDR requirements stated in Protocol Section 18.6.1, Interval Data Recorder Meter Mandatory Installation Requirements. These IDRs used for Load research may be moved as needed.
- (2) ERCOT has the responsibility to monitor and evaluate current Load research samples in the field. For ERCOT sponsored sample sites, ERCOT may request additions, deletions, or a wholesale removal and installation of the IDRs. The process shall follow the Section 15, Load Research Samples.

#### **17.5 Metering for Supplemental Load Profiling**

- (1) If a Competitive Retailer (CR) wants supplemental Load Profiling (i.e., Direct Load Control (DLC), Time Of Use (TOU), etc.), the CR shall follow procedures in Section 16, Supplemental Load Profiling. Metering for supplemental Load Profiling shall be in accordance with Protocol Section 10, Metering, and Protocol Section 18, Load Profiling.
- (2) All Interval Data Recorder (IDR) installations for supplemental Load Profiling shall be consistent with IDR metering requirements in Protocol Section 10.9.2, TSP or DSP Metered Entities. Additionally, any TOU metering for supplemental Load Profiling shall be able to collect and record meter data into specified TOU periods approved by the Public Utility Commission of Texas (PUCT).

**ERCOT Load Profiling Guide**  
**Section 18: Access to Load Profiling Materials**

**October 1, 2010**

**PUBLIC**

**18 ACCESS TO LOAD PROFILING MATERIALS ..... 18-1**



## 18 ACCESS TO LOAD PROFILING MATERIALS

- (1) The following Load Profiling related documents and materials may be found on the ERCOT website:
  - (a) Backcasted (Actual) Load Profiles – Extract files Load Profiles for individual trade days. The trade day occurring one day prior to the current date will be the most current backcast available;
  - (b) Forecasted Load Profiles – Files include current day and three days forward of forecasted Load Profiles;
  - (c) Profile File Format – Spreadsheets that illustrate the layout of the Load Profile extract files;
  - (d) Final Profile Model Report – Report that describes ERCOT Load Profile Models used at Market Open;
  - (e) Historical Backcasted Load Profiles – Multiple years of Load Profile history for each Load Profile Type and Weather Zone combination;
  - (f) Historical Weather Data by Weather Zone – Five years of historical hourly weather data by Weather Zone, covering 1996-2000;
  - (g) Load Profile Data Evaluation Report – Documents that provide an evaluation of the utility data used to generate the ERCOT Load Profile Models.
- (2) Profiling Working Group (PWG) information and meetings may be found on the ERCOT website.

**ERCOT Load Profiling Guide**  
**Section 19: Definitions and Acronyms**

**October 1, 2010**

**19 DEFINITIONS AND ACRONYMS..... 19-2**

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## 19 DEFINITIONS AND ACRONYMS

### 19.1 Definitions

The defined terms in this Section are limited to those used specifically in the Load Profiling Guide (LPG). Any additional defined terms used in the LPG can be found in Protocol Section 2, Definitions and Acronyms.

#### LINKS TO DEFINITIONS:

**A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z;**

#### List of Acronyms

#### A [BACK TO TOP]

##### **Adjusted Static Models**

Load Profiles that are generated from statistical models that are based on static historical Load data, and adjusted for conditions of the day (e.g., weather, Season, etc.)

##### **Annual Validation**

The formal process performed every year whereby ERCOT re-determines the first component of each Load Profile ID—the Load Profile Type—for Residential and Business Load Factor Electric Service Identifiers (ESI IDs). ERCOT then works with the Transmission and/or Distribution Service Providers (TDSPs) to have them update ERCOT's databases with the resulting Load Profile ID changes via Texas Standard Electronic Transactions (TX SETs).

#### B [BACK TO TOP]

##### **Business (BUS)**

Load Profile Group designation for non-residential Electric Service Identifiers (ESI IDs) whose service is metered. This encompasses rate classes for business ESI IDs, in addition to other classes.

**C [BACK TO TOP]****Cutover and Conversion**

Initial data transfer of Transmission and/or Distribution Service Providers' (TDSPs') Electric Service Identifier (ESI ID) data into the ERCOT systems.

**D [BACK TO TOP]****E [BACK TO TOP]****Electric Service Identifier (ESI ID)**

*See Protocol Section 2.1, Definitions.*

***Active ESI ID***

ESI ID is presently receiving service (energized) and a Retail Electric Provider (REP) is currently assigned to it in ERCOT's system.

***De-Energized ESI ID***

ESI ID does not have a REP assigned in ERCOT's system, but has not been retired. An 814\_16, Move-In Request, is necessary to change to active status.

***Inactive ESI ID***

ESI ID is retired and will never again receive service.

**Engineering Estimated**

Estimated Loads based on engineering studies applied to unmetered Loads to allocate energy across specified periods of time.

**F [BACK TO TOP]****G [BACK TO TOP]**

**H [BACK TO TOP]****I [BACK TO TOP]****Interval Data Recorder (IDR) Requirement**

The kW level at which the installation of interval data recorders are required for settlement purposes as set forth in Protocol Section 18.6.1, Interval Data Recorder Meter Mandatory Installation Requirements.

**J [BACK TO TOP]****K [BACK TO TOP]****L [BACK TO TOP]****Lagged Dynamic Profiling Methodology**

The use of an active set of Load research sample sites to build an aggregated Load Profile for the sample group from actual metered usage processed after the target day.

**Load Profile Class**

A classification of a group of Customers having similar energy usage patterns and that are assigned the same Load Profile. Load Profile Class is comprised of a Load Profile Group and a Load Profile Segment. An example of a Load Profile Class: Residential Low Winter Ratio (RESLOWR). Load Profile Type and Load Profile Class are used interchangeably.

**Load Profile Group**

A high-level classification of a set of Customers who have similar characteristics. The Load Profile Groups are: Non-Metered, Residential, and Business. Together, the Load Profile Group and the Load Profile Segment form the Load Profile Type.

**Load Profile ID**

The Load Profile designation string that contains, the Load Profile Type Code, the Weather Zone Code, the Meter Data Type Code, the Weather Sensitivity Code, and the Time Of Use Schedule (TOUS) Code. All Load Profile IDs are listed in Appendix D, Profile Decision Tree.

### **Load Profile Models**

Processes that use analytical modeling techniques to create Load Profiles.

### **Load Profile Segment**

A sub-classification of a Load Profile Group. High Winter Ratio (HIWR) is an example. Together, the Load Profile Group and the Load Profile Segment form the Load Profile Type.

## **M [BACK TO TOP]**

### **Market Open**

January 1, 2002

### **Mean**

A sample statistic or population parameter equal to the sum of all observations divided by the number of observations

### **Meter Data Type**

The component of the Load Profile ID that identifies the type of meter data—either interval or non-interval—that is to be submitted to ERCOT by the Transmission and/or Distribution Service Provider (TDSP) and used for settlement.

## **N [BACK TO TOP]**

## **O [BACK TO TOP]**

### **Opt-In Entity**



A Municipally Owned Utility (MOU) or Electric Cooperative (EC) opting-in to Customer Choice.

## **P [BACK TO TOP]**

### **Power Factor**

The ratio of real power (kW) to the apparent power (kVA) for any given Load and time.

### **Profile Decision Tree**

The document that contains the directions for determining the Load Profile ID to be assigned to an Electric Service Identifier (ESI ID).

**Profile Type** (*see Load Profile Class*)

## **Q [BACK TO TOP]**

## **R [BACK TO TOP]**

### **Representative Interval Data Recorder (RIDR)**

The technique for profiling Premises participating in special pricing programs which consists of implementing a statistically representative Load research sample on the program population. The sample data is then used to develop the RIDR for profiling these Premises.

### **Residential (RES)**

Load Profile Group designation for Electric Service Identifiers (ESI IDs) served within a residential rate class.

## **S [BACK TO TOP]**

### **Sample Design**

The processes by which ERCOT determines the appropriate requirements for a sample of Customer Premises which requirements shall be used to create a Load Profile.

**Segmentation**

The process of dividing a population into a number of sub-sets, according to certain parameters, for the purpose of creating Load Profiles for sub-sets of the population.

**T [BACK TO TOP]****Target Profile**

The Target Profile is the best available estimated Load shape for a particular proposed subgroup.

**U [BACK TO TOP]****Usage Month**

Each Usage Month corresponds with a calendar month and is a combination of one or more usage periods for the purpose of applying usage and Demand values in a consistent manner.

**Usage Profile** (*see Load Profile*)

**V [BACK TO TOP]****W [BACK TO TOP]****Winter Ratio**

The proportion of usage in winter months to usage in the fall base and spring base months and is used to differentiate residential Electric Service Identifiers (ESI IDs).

**X [BACK TO TOP]****Y [BACK TO TOP]**

**Z [BACK TO TOP]****19.2 ACRONYMS**

The defined terms in this Section are limited to those used specifically in the Load Profiling Guide (LPG). Any additional defined terms used in the LPG can be found in Protocol Section 2, Definitions and Acronyms.

<b>BUL</b>	Balancing Up Load
<b>COPS</b>	Commercial Operations Subcommittee
<b>DR</b>	Demand Response
<b>HIWR</b>	High Winter Ratio
<b>LPG</b>	Load Profiling Guide
<b>LPGRR</b>	Load Profiling Guide Revision Request
<b>MAD</b>	Mean Absolute Deviation
<b>MAPE</b>	Mean Absolute Percent Error
<b>NIDR</b>	Non-Interval Data Recorder
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NODEM</b>	Non-Demand
<b>NOTOU</b>	Non-Time Of Use
<b>NWS</b>	Non-Weather Sensitive
<b>PWG</b>	Profiling Working Group
<b>LOWR</b>	Low Winter Ratio
<b>RIDR</b>	Representative Interval Data Recorder
<b>RMSE</b>	Root Mean Square Error

**ERCOT Load Profiling Guide  
Appendix A**

**October 1, 2010**

**APPENDIX A.....1**

## Appendix A

Appendix intentionally left blank

**ERCOT Load Profiling Guide  
Appendix B**

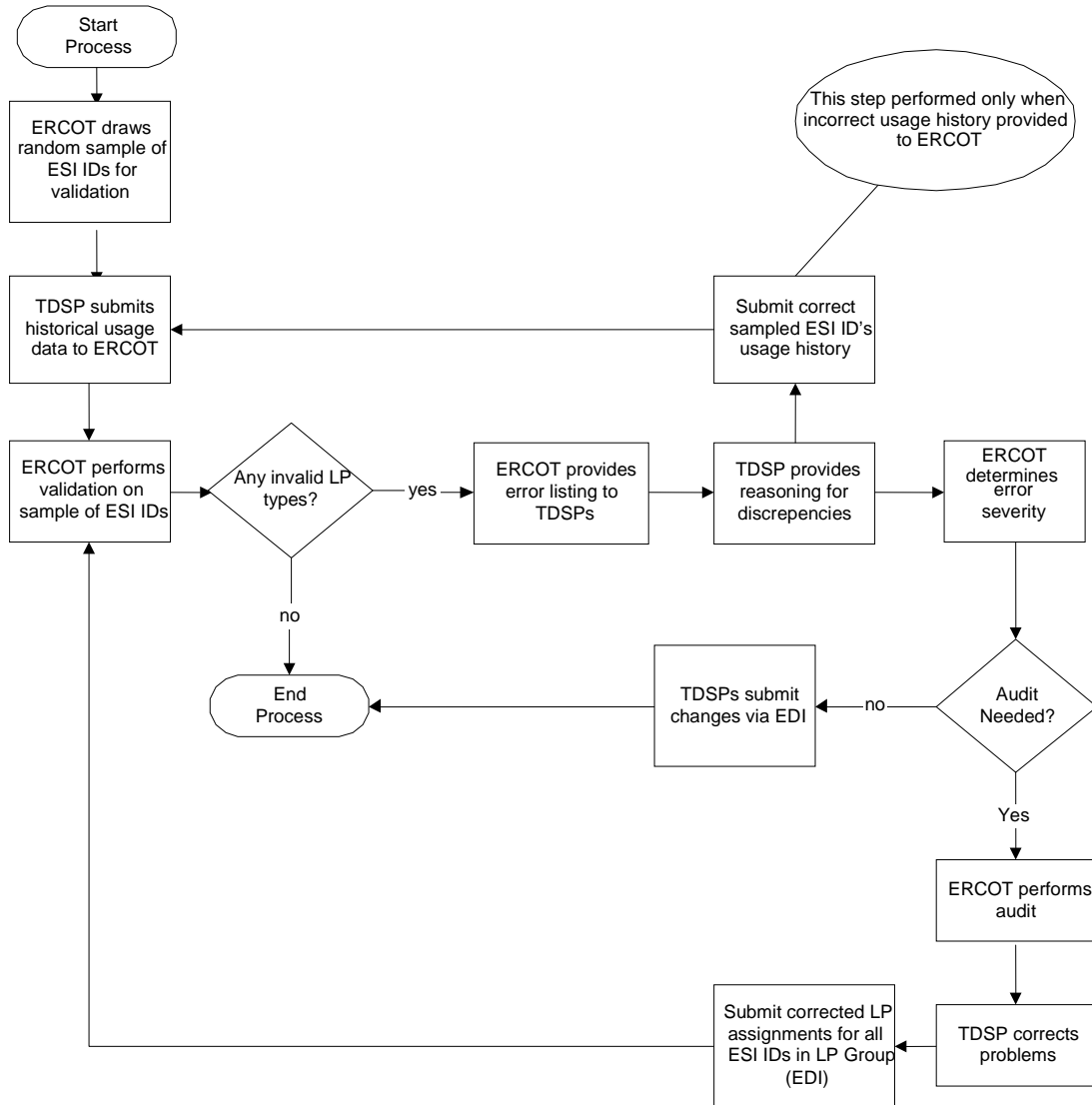
**October 1, 2010**

**APPENDIX B.....1**



## Appendix B

# Validation of Initial Assignment of Load Profile Type Code



**ERCOT Load Profiling Guide  
Appendix C**

**October 1, 2010**

**APPENDIX C ..... 1**

## Appendix C

### Measuring Differences Between Load Profiles

- (1) This Appendix describes and illustrates measures that may be used for assessing the differences between Load Profiles.
- (2) Differences between Load Profiles are a consideration in many decisions regarding Load Profiling Methods and models, such as:
  - (a) Evaluating Load Profile Model performance or methodologies (Section 8, Load Profile Models, and Section 7, Requests for Changes to Load Profiling Methodology);
  - (b) Evaluating requests for changes to Load Profile Segments or Weather Zones (Section 12, Request for Load Profile Segment Changes, Additions, or Removals, and Section 13, Changes to Weather Zone Definitions); and
  - (c) Designing Load research samples (Section 15, Load Research Samples).

### Target and Default Load Profiles

- (1) In most cases when Load Profile differences are measured, the question of concern is whether an existing or proposed method or model is adequate in a particular context, or an alternative is needed. The alternative might be a finer Segmentation or Weather Zone, use of more recent or more local data in estimating models, or an alternative Load Profiling Methodology. In all these cases, the analysis compares a “target” Load Profile against a “default” Load Profile.
- (2) The default Load Profile is the one generated by the existing method or model, or the one that is used if the alternative is not accepted. The Target Profile is the best available estimated Load shape for a particular proposed subgroup. The default Load Profile is good enough to represent the target if the two are not significantly different. Some examples of default and Target Profiles in addressing particular questions are given in the following Table C-1, Examples of Target and Default Profiles.

**Table C-1  
Examples of Target and Default Profiles**

<b>Question</b>	<b>Target Profiles</b>	<b>Default Profile</b>
Should an existing profile segment be subdivided into two smaller segments?	Load shape for each of the proposed subsegments	Load Profile for the existing segment
Should an existing Weather Zone be subdivided?	Calculated load profiles using weather data from each of the proposed subdivisions	Calculated Load Profile using weighted average data from the entire current Weather Zone.
Do models need to be re-estimated using more current load research data?	Class load shapes estimated directly from current load research data	Load Profiles calculated using the existing model and current weather.

### **Load Shape Parameters**

Load shapes may be compared in terms of several different parameters that characterize the Load shape. Some of these parameters are a series of numbers that jointly characterize the shape. Others are single parameters that represent a key characteristic.

### **General Notation**

The following general notation is used in this Appendix, and elsewhere in the Load Profiling Guide (LPG). General quantities are defined. Suffixes and subscripts are used to signify specific quantities. Explicit definitions are given in the formulas that follow.

### **General Quantities**

e	=	Elasticity of electricity Demand with respect to the commodity price
E	=	Energy
f	=	Fraction
DWL	=	Deadweight loss
L	=	Load
LF	=	Load factor
N	=	Number of intervals in a period for which the quantity is calculated
r	=	Ratio
$u_t$	=	Market commodity price at interval t
T	=	Total across some calendar dimension (clock-hour, day-type, month, Season, year, on- or off-peak period)
U	=	Load-weighted average price

### Suffixes

D = Daily  
 H = Clock-hourly  
 M = Monthly  
 S = Seasonal  
 Y = Yearly

### Subscripts

d = Day  
 m = Month  
 h = Clock-hour  
 p = Day-type  
 ON = On-peak  
 OFF = Off-peak  
 s = Segment  
 t = Interval  
 z = Weather Zone

### Series Parameters

- (1) Series parameters include:
  - (a) Unitized Load shape, or interval fractions;
  - (b) Monthly fractions;
  - (c) Daily fractions; and
  - (d) Clock-hour fractions by day-type.

### Unitized Load Shapes

- (1) A Load Profile defines the fraction of total energy use over a period that occurs in each time interval within the period. For most comparisons of Load shapes for purposes of Load Profiling, the Load shapes shall first be unitized. That is, the interval total or average Loads for the group are translated into interval fractions.
- (2) For most comparisons, the time period of interest is a year and the fractions are calculated as fractions of total annual energy consumption. In some cases, shorter time periods such as a Season or month may be used.
- (3) The unitized Load  $f_t$  for time interval  $t$  is calculated from the interval Loads  $L_t$  as
 
$$f_t = (\text{Load at interval } t) / (\text{sum of Loads over all intervals in the period}).$$

$$= L_t / T$$

where

$$T = \sum_t L_t$$

and the summation is over all intervals in the period.

- (4) Each of the other Load shape characteristics described below may be calculated using Loads  $L_t$  as indicated in the formulas, or using the unitized Loads  $f_t$  in place of  $L_t$ . The same result shall be obtained either way.

### **Profile Totals**

If interval data are finer than hourly, the hourly Loads may be averaged for each hour of the period to get the hourly Demand, equal to the total energy in each hour. For quarter-hour data, each hour's four quarters are averaged to give the hourly value.

### **Hourly totals**

TH are the sum over days in the period for each of the 24 hours in a day. Hourly totals may be calculated across a year, a month, or a day-type.

### **Daily totals**

TD are the sum over hours in each day of the hourly values.

### **Day-type totals**

TP are the sum over all hours in the day-type of the hourly values.

### **Monthly totals**

TM are the sum over days in the month of the daily totals.

### **Seasonal totals**

TS are the sum over all the months in a Season of the monthly totals.

### **Yearly totals**

TY are the sum over all the months in the year of the monthly totals.

### **On-peak totals**

$T_{ON}$  are the sum over all on-peak hours in the period of the hourly values.

### **Off-peak totals**

$T_{OFF}$  are the sum over all off-peak hours in the period of the hourly values.

## Profile Fractions

A year, Season, or month of Load data may be condensed into the fraction of total consumption occurring in each month, day, clock-hour, or day-type.

## Monthly Fractions

For each month  $m = 1$  to 12, the monthly fraction  $fM_m$  is calculated as

$$\begin{aligned} fM_m &= (\text{sum of interval Loads in month } m) / (\text{sum of all interval Loads in the year}) \\ &= (\sum_{t \in M_m} L_t) / (\sum_t L_t). \\ &= TM_m / TY. \end{aligned}$$

where

$t$  = interval of time

$M_m$  = indicates month  $m$

$L_t$  = Load at interval  $t$

$TM_m$  and  $TY$ , respectively, are Load totals over month  $m$  and over the year.

## Daily Fractions

- (1) Daily fractions may be calculated similarly to monthly fractions. Daily fractions may be calculated as fractions of the year or separately for each month. The daily fraction for day  $d$  is calculated as

$$\begin{aligned} fD_d &= (\text{sum of interval Loads in day } d) / (\text{sum of all interval Loads in the period}) \\ &= (\sum_{t \in D_d} L_t) / (\sum_t L_t). \\ &= TD_d / T \end{aligned}$$

where

$t$  = interval of time

$D_d$  = day  $d$

$L_t$  = Load at interval  $t$

$TD_d$  and  $T$ , respectively are Load total sums over day  $d$  and over the entire period (e.g., year or month) for which the daily fractions are calculated.

- (2) This calculation gives one daily fraction for every day of the month or year.

## Clock-Hour Fractions by Day-type

- (1) When hourly data are used, the unitized Load gives one hourly fraction for each hour of the month or year. This information may be condensed to give the average clock-hour fraction for a period. Each of the 24 hourly totals  $TH_{ph}$  for the period is divided by the total for the period,  $TM$ ,  $TP$  or  $TY$ . For clock hour  $h$ , the clock-hour fraction for day-type  $p$  is calculated as

$$fH_{ph} = TH_{ph} / TP_p$$



where

$TH_{ph}$  is the interval Load totals for day-type  $p$  and clock-hour  $h$ , and  $TP_p$  is the total over all hours.

(2) Clock-hour fractions for a month or year are calculated analogously.

### Single Parameters

Single parameters include:

- (a) Load factor;
- (b) On-/off-peak ratio;
- (c) Seasonal consumption ratio;
- (d) Weekday fraction; and
- (e) Load-weighted average price.

### Load Factor

The Load factor for a period is the ratio of the average to the peak Load for the period:

$$LF = (\text{average Load})/(\text{maximum Load}) \\ = (T/N) / \max(L_t)$$

where

$L_t$  = Load at interval  $t$

$T$  = sum of interval Loads over all intervals in the period

$N$  = the number of intervals in the period.

### Average Load Factor

(1) Average Load factor is an average of monthly Load factors. This average is computed as

$$AvgLF = \left[ \frac{\left( \sum_{m=1}^{12} AHUse_m \right)}{\sum_{m=1}^{12} MaxKW_m} \right]$$

where

$AHUse_m$  = average hourly use in billing month  $m$

$$= \text{KWh}_m / (\text{billing days} \times 24)$$

MaxKW<sub>m</sub> = maximum metered kW Demand in billing month m

- (2) This definition and notation are consistent with Appendix D, Profile Decision Tree.
- (3) In terms of the notation used elsewhere in this Appendix, if the interval t is hourly,

$$\text{AHUse}_m = T_m / N_m$$

and

$$\text{MaxkW}_m = \max(L_t)_m.$$

Thus,

$$\text{Avg}LF = \left[ \frac{\left( \sum_{m=1}^{12} (T_m / N_m) \right)}{\sum_{m=1}^{12} \left( \max_{t \in M_m} (L_t) \right)} \right]$$

### On-peak/Off-peak Ratio

The on-peak/off-peak ratio is the ratio of total consumption during on-peak periods to the consumption during off-peak periods. The specific definition depends on the definitions of on-peak and off-peak periods. The ratio is calculated as

$$\begin{aligned} r_{\text{on/off}} &= (\text{on-peak consumption}) / (\text{off-peak consumption}) \\ &= T_{\text{ON}} / T_{\text{OFF}} \end{aligned}$$

where

$$\begin{aligned} T_{\text{ON}} &= \text{sum of interval Loads over all intervals in on-peak periods} \\ T_{\text{OFF}} &= \text{sum of interval Loads over all intervals in off-peak periods.} \end{aligned}$$

### Seasonal Consumption Ratios

Seasonal consumption ratios are the ratio of total consumption in one Season to consumption in another Season. Most common is the ratio of summer to winter consumption. The ratio of summer to annual or winter to annual consumption may also be used. When using the seasonal consumption ratio calculation, the months of the Seasons being used shall be defined. The ratios are calculated as

$$\begin{aligned} r_{S1/S2} &= (\text{total for Season 1}) / (\text{total for Season 2}) \\ &= TS1 / TS2 \end{aligned}$$

where

TS1 and TS2 denote totals of interval Loads over the two Seasons being compared.

### Load-Weighted Average or Annual Price

- (1) The Load-weighted average price  $U$  for a period is calculated as

$$U = \frac{\sum_t L_t u_t}{\sum L_t}$$

where

$L_t$  = Load at interval  $t$

$u_t$  = market price for commodity at time interval  $t$

the summation is over all intervals  $t$  in the period.

- (2) Equivalently, the Load-weighted average price may be calculated from the unitized Loads as

$$U = \frac{\sum f_t u_t}{\sum f_t}$$

where

$f_t$  is the unitized Load defined above.

- (3) Load-weighted average price is most often considered on an annual basis. When the period is annual the Load-weighted average price is also called the Load-weighted annual price.
- (4) Unlike the other parameters defined, Load-weighted average price is not only a characteristic of a Load shape, but depends also on the price series  $u_t$ . When Load-weighted average price is used, the price series shall be specified.

### Hourly and Quarter-Hourly Load Data

- (1) Although ERCOT uses quarter-hourly data for Settlement, hourly Load data may be used for supporting analysis to assess Load Profiling Methods. When hourly data are used, the intervals  $t$  are hourly. In this case, the Load  $L_t$  in Demand for each interval  $t$  is equal to the energy for the interval, and the sum of the Loads  $T$  is the total profile energy for the period.
- (2) For calculations expressed as the ratio of Loads, the ratio may be calculated in the same way whether the Load data are hourly or quarter-hourly. The same result will be obtained either way. This rule applies to unitized Loads, Load factor, on/off-peak ratio, and seasonal consumption ratios.

### Measuring Differences Between Two Load Profiles

#### DIRECT COMPARISON OF SIMPLE PARAMETERS

- (1) Simple parameters are those that represent a Load shape in terms of a single number. These parameters include the following:

- (a) Load factor;
  - (b) On-/off-peak ratios;
  - (c) Seasonal consumption ratios; or
  - (d) Load-weighted average price.
- (2) Each simple parameter may be the basis for measuring differences between Load Profiles. The value of the parameter for the Target Profile is subtracted from the value for the default profile. For example, the difference in Load factors is expressed as:

$$\Delta LF = LF_{\text{Default}} - LF_{\text{Target}}$$

- (3) This difference may be thought of as the magnitude of the error if the default profile is used to represent the target.

### **Comparison of Two Series**

- (1) A Load Profile over a year may be characterized by:
- (a) Its unitized Load shape;
  - (b) The separately unitized Load shapes for each month;
  - (c) The 12 monthly fractions;
  - (d) The 24 clock-hour fractions for the year; or
  - (e) The set of 24 clock-hour fractions for each month or day-type.
- (2) For any of these series, two Load Profiles may be compared in terms of various summary measures of the difference between their two series. Each of these summary measures is called a measure of “error” or “deviation.” In the context of comparing two Load Profiles, this error is a measure of how far the default Load profile is from the target.

### **Mean Deviation**

The simplest measure of difference is the average difference in values or deviation between corresponding elements of the series. The Mean deviation is calculated by:

- (a) Taking the difference between the default and target for each element in the series; or
- (b) Taking the Mean of these differences over all terms in the series.

### Mean Absolute Deviation (MAD)

MAD is calculated by:

- (a) Taking the difference between the default and target for each element in the series;
- (b) Taking the absolute value of each difference; or
- (c) Taking the mean of these absolute differences over all terms in the series.

Thus,

$$\text{MAD} = (1/J) \sum_j |X_{\text{TARGET}j} - X_{\text{DEFAULT}j}|$$

where

J is the number of elements in the series (e.g., 12 for monthly fractions, 365 for daily fractions of the year, 24 for clock-hour fractions of a period).

### Mean Absolute Percent Error (MAPE)

The MAPE is calculated by:

- (a) Taking the difference between the default and target for each element in the series;
- (b) Taking the absolute value of each difference expressing this absolute value as a percent of the target value; or
- (c) Taking the Mean of these absolute percent errors over all terms in the series.

Thus,

$$\text{MAPE} = (1/J) \sum_j |X_{\text{TARGET}j} - X_{\text{DEFAULT}j}| / X_{\text{TARGET}j}$$

where

J is the number of elements in the series (e.g., 12 for monthly fractions, 365 for daily fractions of the year, 24 for clock-hour fractions of a period).

### Root Mean Square Error (RMSE)

The RMSE is calculated by:

- (a) Taking the difference between the default and target for each element in the series;
- (b) Squaring each difference;
- (c) Taking the Mean of the squared difference over all terms in the series; or
- (d) Taking the square root of the Mean squared difference.

Thus,

$$\text{RMSE} = \sqrt{(1/J) \sum_j (X_{\text{TARGET}_j} - X_{\text{DEFAULT}_j})^2}$$

where

J is the number of elements in the series (e.g., 12 for monthly fractions, 365 for daily fractions of the year, 24 for clock-hour fractions of a period).

### **Measuring Differences for a Group of Load Profiles**

Some decisions require comparisons across a group of Load Profiles that are jointly affected by a possible change. Key examples of such decisions are to either:

- (a) Subdivide an existing segment into smaller segments;
- (b) Subdivide an existing Weather Zone into smaller Weather Zones;
- (c) Change segment definitions in a way that shall affect multiple segments;  
or
- (d) Change the boundaries of Weather Zones in ways that shall affect multiple Weather Zones.

### **Deadweight Loss Reduction**

One measure that reflects the combined effects of a change on several Load Profiles is deadweight loss. A reduction in deadweight loss is the gain in economic efficiency due to providing Customers with Load Profiles that are closer to their true Load shapes. This reduction is a value to society, measured in dollars per year. Given that ERCOT's costs are ultimately paid by consumers through their electricity rates, this societal value is theoretically the maximum that it would be worth to implement a change paid for by ERCOT. Changes that would cost more than this to implement shall cost more than the economic value of the benefit.

### **Deadweight Loss Reduction from Finer Subdivision**

- (1) When performing an analysis where a single group is divided into smaller groups, the Load Profiles for the smaller segments or zones are considered the Target Load Profiles. The profile for the single group is considered the default Load Profile. The difference between the default and each of the Target Profiles may be measured by any of the difference measures described in this Appendix titled Measuring Differences between Two Load Profiles, as described in Section 12.6.2, Difference from Current Load Profile Segments.
- (2) The combined effect of subdividing may be expressed as the deadweight loss reduction. The calculation formula is

$$\Delta DWL = \frac{1}{2} e \sum_k E_k U_0 \left( \frac{U_k - U_0}{U_0} \right)^2$$

Where

$e$  = Elasticity of electricity Demand with respect to the commodity price

$E_k$  = Total annual consumption for subgroup  $k$  of group 0 (kWh)

$U_k$  = Load-weighted annual price for subgroup  $k$  of group 0 (\$/kWh)

$U_0$  = Load-weighted annual price for the group 0 (\$/kWh).

- (3) For purposes of this calculation, elasticity estimates from secondary sources may be considered, and scenario analysis using a range of values may be used. A value of 0.2 has been used in some studies. Note that the annual consumption  $E_k$  is the total energy use of all Customers represented by the subgroup profile  $k$ . If the profile is scaled so that the profile hourly value is an estimate of total Load for all Customer represented by the profile, the annual consumption  $E_k$  is the sum of the profile hourly values over all hours in the year. If the profile is scaled in some other way, the group annual consumption  $E_k$  may be very different from the sum of the profile hourly values.
- (4) To apply this formula to subdivisions of a Weather Zone, the combined group 0 is the entire Weather Zone. Each subgroup  $k$  is a subdivision proposed as a new Weather Zone. The formula is evaluated separately for each Load Profile Segment, and summed over segments to provide the total benefit of the Weather Zone subdivision.
- (5) To apply this formula to subdivisions of a segment, the combined group 0 is the entire current segment. Each subgroup  $k$  is a subdivision proposed as a new segment. The formula is evaluated separately for each Weather Zone, and summed over Weather Zones to provide the total benefit of the segment subdivision.
- (6) In either case, the subgroup profiles  $k$  defined by profile segment and Weather Zone are applied to the interval prices  $u_t$  to produce distinct Load-weighted

average annual prices  $U_k$ . The Load-weighted average annual price for the existing segment or Weather Zone is  $U_0$ .

### **Deadweight Loss Reduction if Only One Subdivision Changes**

If only one proposed new segment shall have a new Load Profile, while the remainder shall continue to have the existing Load Profile, the deadweight loss formula reduces to

$$\Delta DWL = \frac{1}{2} e E_{k^*} U_0 \left( \frac{U_{k^*} - U_0}{U_0} \right)^2$$

where the subscript  $k^*$  indicates the proposed new segment. All other terms in the summation for the full formula are zero.

### **Deadweight Loss Reduction by Creating a New Segment from Multiple Segments**

- (1) When performing an analysis where several groups are being combined to form a single group, the Load Profile for the single group is considered the Target Load Profile. The Load Profiles for the groups contributing to the formation of the single group are considered the default Load Profiles. Examples where such analyses shall apply include:
  - (a) Changing a Weather Zone boundary so that a portion is removed from one zone and added to another
  - (b) Changing a set of Load Profile Segment definitions so that part of one segment is shifted from one to another
  - (c) Choosing between two alternative schemes for defining Weather Zones or Load Profile Segments.
- (2) Any of these choices may be assessed as a difference among possible subdivisions using the formula titled “Deadweight Loss from Finer Subdivision.” If a single group may be divided into subgroups the deadweight loss reduction from each possible subdivision is calculated using the formula. The method with the greatest deadweight loss reduction is the preferred method.
- (3) Thus, to request a change of the definitions of existing segments, a combined segment that includes all segments affected by the change is considered. The deadweight loss reduction from “subdividing” the combined segment is then calculated. Likewise, the deadweight loss reduction from subdividing the combined segment into the proposed new set of definitions is calculated. The reduction from the current segmentation is subtracted from the reduction from the proposed segmentation. Theoretically, the proposed segmentation is justified in terms of societal value if this difference is greater than the total cost of implementing the change.



- (4) A change that involves moving a part of a group into another group, or a combination of such moves, may be assessed using this same approach. The combination of all affected subgroups is considered as the overall group. The original and alternative groupings are then regarded as two possible subdivisions of this overall group. The deadweight loss reduction compared to having the full combined group is evaluated for each of these “subdivisions.” The preferred subdivision is the one with the greater deadweight loss reduction from the combined group. The benefit of going from the original subdivision to the new one is the increase in the deadweight loss reduction.
- (5) For example, if the group A is to be moved from being included with group B to being included with group C, the combined group is the combination of A, B, and C. Under one “subdivision” the subgroups are A+B and C. Under the other, the subgroups are B and A+C. The change is theoretically worth making if the deadweight loss reduction for (B, A+C) versus (A+B+C) is greater than that for (A+B, C) versus (A+B+C), by an amount greater than the cost of making the change.

#### **Deadweight Loss Reduction from Revising the Load Profile Model Based on Current Load Research Data**

- (1) The Load Profile based on current Load research may be regarded as the best available estimate of the Load Profile for a particular segment. Continuing to use the current model is then viewed as an approximation to this best available or Target Profile. One way to measure the severity of the error in this approximation is in terms of the deadweight loss. Revising the current Load Profile to bring it closer to the target would reduce societal deadweight loss by at most this amount.

Table C-2  
Hypothetical Loads and Prices for Illustration

	Day	Hour	Price (\$/MWh)	Existing Profile Segment		Profile Subsegment A		Profile Subsegment B	
				Load (MWh)	Hourly Cost	Load (MWh)	Hourly Cost	Load B (MWh)	Hourly Cost
				$L_t$	$L_t u_t$	$L_t$	$L_t u_t$	L	$L_t u_t$
1	1		\$20	1,350	\$27,000	1000	\$20,000	1700	\$34,000
1	2		\$19	1,250	\$23,750	1000	\$19,000	1500	\$28,500
1	3		\$17	1,200	\$20,400	1000	\$17,000	1400	\$23,800
1	4		\$15	1,150	\$17,250	1000	\$15,000	1300	\$19,500
1	5		\$14	1,150	\$16,100	1100	\$15,400	1200	\$16,800
1	6		\$15	1,200	\$18,000	1200	\$18,000	1200	\$18,000
1	7		\$19	1,300	\$24,700	1300	\$24,700	1300	\$24,700
1	8		\$26	1,450	\$37,700	1400	\$36,400	1500	\$39,000
1	9		\$29	1,450	\$42,050	1400	\$40,600	1500	\$43,500
1	10		\$35	1,550	\$54,250	1500	\$52,500	1600	\$56,000
1	11		\$77	1,600	\$123,200	1500	\$115,500	1700	\$130,900
1	12		\$150	1,750	\$262,500	1600	\$240,000	1900	\$285,000
1	13		\$140	1,750	\$245,000	1600	\$224,000	1900	\$266,000
1	14		\$250	1,850	\$462,500	1700	\$425,000	2000	\$500,000
1	15		\$330	1,900	\$627,000	1700	\$561,000	2100	\$693,000
1	16		\$360	2,000	\$720,000	1800	\$648,000	2200	\$792,000
1	17		\$340	2,150	\$731,000	1900	\$646,000	2400	\$816,000
1	18		\$330	2,300	\$759,000	1900	\$627,000	2700	\$891,000
1	19		\$170	2,200	\$374,000	1800	\$306,000	2600	\$442,000
1	20		\$130	2,200	\$286,000	1800	\$234,000	2600	\$338,000
1	21		\$74	2,200	\$162,800	1800	\$133,200	2600	\$192,400
1	22		\$82	2,100	\$172,200	1600	\$131,200	2600	\$213,200
1	23		\$33	1,850	\$61,050	1400	\$46,200	2300	\$75,900
1	24		\$24	1,600	\$38,400	1200	\$28,800	2000	\$48,000
2	1		\$13	950	\$12,350	800	\$10,400	1100	\$14,300
2	2		\$13	850	\$11,050	800	\$10,400	900	\$11,700
2	3		\$12	850	\$10,200	800	\$9,600	900	\$10,800
2	4		\$12	800	\$9,600	800	\$9,600	800	\$9,600
2	5		\$13	850	\$11,050	900	\$11,700	800	\$10,400
2	6		\$15	900	\$13,500	1000	\$15,000	800	\$12,000
2	7		\$23	1,000	\$23,000	1100	\$25,300	900	\$20,700
2	8		\$22	1,050	\$23,100	1200	\$26,400	900	\$19,800
2	9		\$18	1,050	\$18,900	1200	\$21,600	900	\$16,200
2	10		\$21	1,150	\$24,150	1300	\$27,300	1000	\$21,000
2	11		\$20	1,150	\$23,000	1300	\$26,000	1000	\$20,000
2	12		\$18	1,150	\$20,700	1300	\$23,400	1000	\$18,000
2	13		\$17	1,150	\$19,550	1300	\$22,100	1000	\$17,000
2	14		\$18	1,200	\$21,600	1300	\$23,400	1100	\$19,800
2	15		\$15	1,200	\$18,000	1300	\$19,500	1100	\$16,500
2	16		\$15	1,250	\$18,750	1400	\$21,000	1100	\$16,500
2	17		\$23	1,350	\$31,050	1500	\$34,500	1200	\$27,600
2	18		\$36	1,500	\$54,000	1500	\$54,000	1500	\$54,000
2	19		\$27	1,500	\$40,500	1500	\$40,500	1500	\$40,500
2	20		\$23	1,500	\$34,500	1500	\$34,500	1500	\$34,500
2	21		\$22	1,450	\$31,900	1500	\$33,000	1400	\$30,800
2	22		\$19	1,450	\$27,550	1400	\$26,600	1500	\$28,500
2	23		\$16	1,250	\$20,000	1200	\$19,200	1300	\$20,800
2	24		\$14	1,100	\$15,400	1000	\$14,000	1200	\$16,800
<b>SUM</b>			<b>\$3,144</b>	<b>68150</b>	<b>\$5,839,250</b>	<b>64100</b>	<b>\$5,183,500</b>	<b>72200</b>	<b>\$6,495,000</b>

- (2) The deadweight loss due to using the current Load Profile Model (default) rather than the target is calculated as

$$DWL = \frac{1}{2} e E U_{\text{DEFAULT}} \left( \frac{U_{\text{TARGET}} - U_{\text{DEFAULT}}}{U_{\text{DEFAULT}}} \right)^2$$

Where

$e$  = Elasticity of electricity Demand with respect to the commodity price

$E$  = Total energy consumption for the profile segment (MWh)

$U_{\text{TARGET}}$  = Load-weighted average annual commodity price using the Target Profile for the segment (\$/MWh)

$U_{\text{DEFAULT}}$  = Load-weighted average annual commodity price using the default profile for the segment (\$/kWh).

#### Illustration of Measures of Differences

- (1) To illustrate some of the measures of differences, following Table C-2, Hypothetical Loads and Prices for Illustration, shows hourly Loads and hourly market prices for a hypothetical period of two days. Loads are shown for two sub segments that together make up an existing segment within a Weather Zone. The highlighted hours are on-peak hours, which are defined as hour ending 0800 through 1900.
- (2) Following Table C-3, Single Parameter Characteristics and Differences, shows some of the single-parameter characteristics statistics for each of the three Load Profiles. Also shown are the differences between each subsegment and the existing combined segment. These differences are the errors if the subsegments are considered as the targets and the combined is the default that estimates them if the finer Segmentation is not adopted.

**Table C-3**  
**Single Parameter Characteristics and Differences**

SUMMARY MEASURES BY PROFILE	Existing	Subsegment A	Subsegment B
Total Cost of Profile Energy	\$5,839,250	\$5,183,500	\$6,495,000
Total Profile Energy	68,150	64,100	72,200
<b>Load-weighted average price</b>	<b>\$85.68</b>	<b>\$80.87</b>	<b>\$89.96</b>
On-peak Energy	36,650	35,900	37,400
Off-peak Energy	31,500	28,200	34,800
<b>On-/off-peak ratio</b>	<b>1.16</b>	<b>1.27</b>	<b>1.07</b>
Profile Peak Load	2,300	1,900	2,700
<b>Load Factor</b>	<b>0.62</b>	<b>0.70</b>	<b>0.56</b>
<b>DIFFERENCES FROM EXISTING</b>			
Load-weighted average price		-4.8	4.3
On-/off-peak ratio		0.11	-0.09
Load Factor		0.09	-0.06

- (3) Following Table C-4, Daily and Clock-Hour Totals and Fractions, shows the calculations of daily and clock-hour totals and fractions.

**Table C-4**  
**Daily and Clock-Hour Totals and Fractions**

	Day	Hour	Existing Segment		Subsegment A		Subsegment B	
			Totals	Fractions	Totals	Fractions	Totals	Fractions
<b>Daily</b>								
	1		40,500	0.59	35,200	0.55	45,800	0.63
	2		27,650	0.41	28,900	0.45	26,400	0.37
	<b>SUM</b>		<b>68,150</b>	<b>1.00</b>	<b>64,100</b>	<b>1.00</b>	<b>72,200</b>	<b>1.00</b>
<b>Clock-Hour</b>								
		1	2,300	0.03	1,800	0.03	2,800	0.04
		2	2,100	0.03	1,800	0.03	2,400	0.03
		3	2,050	0.03	1,800	0.03	2,300	0.03
		4	1,950	0.03	1,800	0.03	2,100	0.03
		5	2,000	0.03	2,000	0.03	2,000	0.03
		6	2,100	0.03	2,200	0.03	2,000	0.03
		7	2,300	0.03	2,400	0.04	2,200	0.03
		8	2,500	0.04	2,600	0.04	2,400	0.03
		9	2,500	0.04	2,600	0.04	2,400	0.03
		10	2,700	0.04	2,800	0.04	2,600	0.04
		11	2,750	0.04	2,800	0.04	2,700	0.04
		12	2,900	0.04	2,900	0.05	2,900	0.04
		13	2,900	0.04	2,900	0.05	2,900	0.04
		14	3,050	0.04	3,000	0.05	3,100	0.04
		15	3,100	0.05	3,000	0.05	3,200	0.04
		16	3,250	0.05	3,200	0.05	3,300	0.05
		17	3,500	0.05	3,400	0.05	3,600	0.05
		18	3,800	0.06	3,400	0.05	4,200	0.06
		19	3,700	0.05	3,300	0.05	4,100	0.06
		20	3,700	0.05	3,300	0.05	4,100	0.06
		21	3,650	0.05	3,300	0.05	4,000	0.06
		22	3,550	0.05	3,000	0.05	4,100	0.06
		23	3,100	0.05	2,600	0.04	3,600	0.05
		24	2,700	0.04	2,200	0.03	3,200	0.04
	<b>SUM</b>		<b>68,150</b>	<b>1.00</b>	<b>64,100</b>	<b>1.00</b>	<b>72,200</b>	<b>1.00</b>

- (4) Following Table C-5, Unitized Loads and Difference Measures, shows the unitized Load for the two-day period, and illustrates some of the difference measures based on this series.

**Table C-5  
Unitized Loads and Difference Measures**

Day	Hour	Unitized Loads			Difference from Existing		Absolute Difference		Squared Difference		Absolute Percent Difference	
		Existing	A	B	A	B	A	B	A	B	A	B
1	1	0.95	0.75	1.13	0.20	-0.18	0.20	0.18	0.041	0.032	27.0%	15.9%
1	2	0.88	0.75	1.00	-0.13	0.12	0.13	0.12	0.017	0.014	17.6%	11.7%
1	3	0.85	0.75	0.93	-0.10	0.09	0.10	0.09	0.009	0.007	12.9%	9.2%
1	4	0.81	0.75	0.86	-0.06	0.05	0.06	0.05	0.004	0.003	8.2%	6.3%
1	5	0.81	0.82	0.80	0.01	-0.01	0.01	0.01	0.000	0.000	1.7%	1.5%
1	6	0.85	0.90	0.80	0.05	-0.05	0.05	0.05	0.003	0.002	5.9%	5.9%
1	7	0.92	0.97	0.86	0.06	-0.05	0.06	0.05	0.003	0.003	5.9%	5.9%
1	8	1.02	1.05	1.00	0.03	-0.02	0.03	0.02	0.001	0.001	2.6%	2.4%
1	9	1.02	1.05	1.00	0.03	-0.02	0.03	0.02	0.001	0.001	2.6%	2.4%
1	10	1.09	1.12	1.06	0.03	-0.03	0.03	0.03	0.001	0.001	2.8%	2.6%
1	11	1.13	1.12	1.13	0.00	0.00	0.00	0.00	0.000	0.000	0.3%	0.3%
1	12	1.23	1.20	1.26	-0.03	0.03	0.03	0.03	0.001	0.001	2.9%	2.4%
1	13	1.23	1.20	1.26	-0.03	0.03	0.03	0.03	0.001	0.001	2.9%	2.4%
1	14	1.30	1.27	1.33	-0.03	0.03	0.03	0.03	0.001	0.001	2.4%	2.0%
1	15	1.34	1.27	1.40	-0.07	0.06	0.07	0.06	0.004	0.003	5.1%	4.1%
1	16	1.41	1.35	1.46	-0.06	0.05	0.06	0.05	0.004	0.003	4.5%	3.7%
1	17	1.51	1.42	1.60	-0.09	0.08	0.09	0.08	0.008	0.007	6.4%	5.1%
1	18	1.62	1.42	1.80	-0.20	0.18	0.20	0.18	0.039	0.031	13.9%	9.8%
1	19	1.55	1.35	1.73	-0.20	0.18	0.20	0.18	0.041	0.032	15.0%	10.4%
1	20	1.55	1.35	1.73	-0.20	0.18	0.20	0.18	0.041	0.032	15.0%	10.4%
1	21	1.55	1.35	1.73	-0.20	0.18	0.20	0.18	0.041	0.032	15.0%	10.4%
1	22	1.48	1.20	1.73	-0.28	0.25	0.28	0.25	0.079	0.062	23.5%	14.4%
1	23	1.30	1.05	1.53	-0.25	0.23	0.25	0.23	0.065	0.051	24.3%	14.8%
1	24	1.13	0.90	1.33	-0.23	0.20	0.23	0.20	0.052	0.041	25.4%	15.2%
2	1	0.67	0.60	0.73	-0.07	0.06	0.07	0.06	0.005	0.004	11.7%	8.5%
2	2	0.60	0.60	0.60	0.00	0.00	0.00	0.00	0.000	0.000	0.1%	0.1%
2	3	0.60	0.60	0.60	0.00	0.00	0.00	0.00	0.000	0.000	0.1%	0.1%
2	4	0.56	0.60	0.53	0.04	-0.03	0.04	0.03	0.001	0.001	5.9%	5.9%
2	5	0.60	0.67	0.53	0.08	-0.07	0.08	0.07	0.006	0.004	11.2%	12.6%
2	6	0.63	0.75	0.53	0.11	-0.10	0.11	0.10	0.013	0.010	15.3%	19.2%
2	7	0.70	0.82	0.60	0.12	-0.11	0.12	0.11	0.014	0.011	14.5%	17.7%
2	8	0.74	0.90	0.60	0.16	-0.14	0.16	0.14	0.025	0.020	17.7%	23.6%
2	9	0.74	0.90	0.60	0.16	-0.14	0.16	0.14	0.025	0.020	17.7%	23.6%
2	10	0.81	0.97	0.66	0.16	-0.15	0.16	0.15	0.027	0.021	16.8%	21.8%
2	11	0.81	0.97	0.66	0.16	-0.15	0.16	0.15	0.027	0.021	16.8%	21.8%
2	12	0.81	0.97	0.66	0.16	-0.15	0.16	0.15	0.027	0.021	16.8%	21.8%
2	13	0.81	0.97	0.66	0.16	-0.15	0.16	0.15	0.027	0.021	16.8%	21.8%
2	14	0.85	0.97	0.73	0.13	-0.11	0.13	0.11	0.016	0.013	13.2%	15.6%
2	15	0.85	0.97	0.73	0.13	-0.11	0.13	0.11	0.016	0.013	13.2%	15.6%
2	16	0.88	1.05	0.73	0.17	-0.15	0.17	0.15	0.028	0.022	16.0%	20.4%
2	17	0.95	1.12	0.80	0.17	-0.15	0.17	0.15	0.030	0.023	15.3%	19.2%
2	18	1.06	1.12	1.00	0.07	-0.06	0.07	0.06	0.004	0.004	5.9%	5.9%
2	19	1.06	1.12	1.00	0.07	-0.06	0.07	0.06	0.004	0.004	5.9%	5.9%
2	20	1.06	1.12	1.00	0.07	-0.06	0.07	0.06	0.004	0.004	5.9%	5.9%
2	21	1.02	1.12	0.93	0.10	-0.09	0.10	0.09	0.010	0.008	9.1%	9.7%
2	22	1.02	1.05	1.00	0.03	-0.02	0.03	0.02	0.001	0.001	2.6%	2.4%
2	23	0.88	0.90	0.86	0.02	-0.02	0.02	0.02	0.000	0.000	2.0%	1.9%
2	24	0.77	0.75	0.80	-0.03	0.02	0.03	0.02	0.001	0.001	3.5%	2.9%

Differences from Existing	A	B
Mean Deviation	0.01	-0.01
Mean absolute deviation	0.10	0.09
Root mean square error	0.13	0.11
Mean absolute percent error	10%	10%

First, the unitized Loads are shown for each Load Profile. The differences or errors between each segment and the existing Load Profile are then shown for the unitized Loads. Also shown are the absolute difference, squared error, and absolute percent errors. These are combined at the bottom to give the mean deviation, MAD, MAPE, and RMSE.

- (5) Following Table C-6, Calculation of Deadweight Loss Reduction for Finer Segmentation, illustrates a calculation of the reduction in deadweight loss achieved by changing from the single existing Load Profile to separate Load Profiles for each subsegment.

**Table C-6**  
**Calculation of Deadweight Loss Reduction for Finer Segmentation**

		Existing Combined	Subsegment A	Subsegment B
Total Annual Energy (MWh)	E	900,000	420,000	480,000
Loadweighted annual price (\$/MWh)	U	\$85.68	\$81	\$90
Difference from combined	$U_k - U_0$		-\$5	\$4
Relative difference from combined	$(U_k - U_0)/U_0$		-0.056	0.053
Squared relative difference	$[(U_k - U_0)/U_0]^2$		0.003	0.003
Squared relative difference times subsegment energy	$E_k [(U_k - U_0)/U_0]^2$		1,327	1,342
Squared relative difference times energy and combined price	$E_k U_0 [(U_k - U_0)/U_0]^2$		\$113,715	\$115,002
Sum of subsegment terms	$\Sigma E_k U_0 [(U_k - U_0)/U_0]^2$	\$228,717		
Assumed elasticity	e	0.2		
Deadweight loss reduction	$\Delta DWL$	\$22,872		

## Steps for Assigning a Profile Segment

### Overview:

After determining the appropriate Profile Group (NM, RES, or BUS) the next step is to determine the correct Profile Segment, per the instructions below. For any value that is to be rounded, follow the Rounding instructions on the Definitions tab. Information on the terms below can be found on the Definitions tab and the Usage Month Methodology tab.

### I. Non-Metered (NM)

- A. Assign the LIGHT Profile Segment for all Non-Metered lighting load, e.g., street lights.
- B. Assign the FLAT Profile Segment for all Non-Metered load that is not identified as lighting, e.g., traffic signals.

### II. Residential (RES)

**Usage Time Period: The four-year period ending May 31 of the current calendar year (inclusive)**

For each ESI ID, step through 'A' and then 'B' or 'C' below as appropriate to determine the applicable Profile Segment. Then follow the instructions in 'D' below for ESI IDs that have Distributed Generation (per the DG tab).

- A. Assign the default Profile Segment for the initial assignment of all new Residential ESI IDs as directed below. Please refer to the Load Profiling Guide for Opt-In and transition assignments.

If Weather Zone = COAST or if Weather Zone = FWEST then  
assign LOWR  
else assign HIWR.

COAST default = LOWR	NORTH default = HIWR
EAST default = HIWR	SCENT default = HIWR
FWEST default = LOWR	SOUTH default = HIWR
NCENT default = HIWR	WEST default = HIWR

- B. For Annual Validation, assign the applicable Profile Segment for each ESI ID based on the steps below. Because the steps below are not mutually exclusive, it is necessary to step through each of the following in the order listed, for each ESI ID, until an applicable case is found. Once an applicable case has been found follow the instructions below in Section C. Distributed Generation Profile Segment determination.

1. For each RES ESI ID, identify all usage data for which the entire meter read period falls between Sep 20 and May 10 (inclusive) for the various years of the Usage Time Period and spans no longer than 44 days. Use the resulting data from this step in the subsequent steps.

Note: Step 1 allows for only the Winter and Shoulder meter reads to be included in the subsequent steps to determine the Segment assignment. Meter reads are to be classified as Winter or Shoulder reads in step 2.

2. For each meter read usage value determine if the read is a Winter or a Shoulder season for each RES ESI ID.

If start date  $\geq$  Dec 01 or stop date  $\leq$  Mar 01 then season = Winter  
else if start date  $\geq$  Sept 20 and stop date  $\leq$  Dec 01 then  
season = Shoulder  
else if start date  $\geq$  Mar 01 and stop date  $\leq$  May 11 then  
season = Shoulder  
otherwise calculate shoulder percent as follows:  
if the read spans Dec 01 then  
shoulder\_percent = (Dec 01 - start date) / (stop date - start date)  
if the read spans Mar 01 then  
shoulder\_percent = (Mar 01 - start date) / (stop date - start date)  
if shoulder\_percent  $\geq$  0.6 then season = Shoulder  
if shoulder\_percent  $\leq$  0.4 then season = Winter  
if a meter read has not been classified by season above then disregard the read

3. Calculate Average Daily Use for the meter read period ( $ADUse_p$ ) and assign a year value for each reading for each ESI ID.

$$ADUse_p = \left( \frac{kWh_p}{Days_p} \right)$$

Let

## Steps for Assigning a Profile Segment

yy = July 1st of current year  
 yy-1 = July 1st of last year  
 yy-2 = July 1st of two years ago  
 yy-3 = July 1st of three years ago

If stop date < yy-3 then  
     year value = 1  
 else if stop date < yy-2 then  
     year value = 2  
 else if stop date < yy-1 then  
     year value = 3  
 else year value = 4

4. Calculate the mean and standard deviation (stdev) of the Average Daily Use (ADUse<sub>p</sub>) for each ESI ID. If stdev > 0 then create a normalized ADUse<sub>p</sub> (NADUse<sub>p</sub>), use the NADUse<sub>p</sub> to identify outliers and set their reading usage values and ADUse<sub>p</sub> to null.

$$NADUse_p = \left( \frac{ADUse_p - \overline{ADUse}}{stdev} \right)$$

where

$$\overline{ADUse} = \left( \frac{\sum_{p=1}^n ADUse_p}{n} \right)$$

$$stdev = \sqrt{\frac{\sum_{p=1}^n (ADUse_p - \overline{ADUse})^2}{n - 1}}$$

and *n* = number of meter readings for the ESI ID

If NADUse<sub>p</sub> > 3.5 or  
 if NADUse<sub>p</sub> > 3 and ADUse<sub>p</sub> > 100 or  
 if NADUse<sub>p</sub> < -2 or  
 if NADUse<sub>p</sub> < 5 then  
     kWh<sub>p</sub> = null  
     ADUse<sub>p</sub> = null  
 else  
     kWh<sub>p</sub> = kWh<sub>p</sub>  
     ADUse<sub>p</sub> = ADUse<sub>p</sub>

5. Count the number of readings that have a usage value (not null) for each Season and continue with Step 6 for those ESI IDs that have more than two Winter readings and more than two Shoulder readings. For those ESI IDs that do not have sufficient number of readings do not change the current Load Profile Type assignment.

6. For each meter reading time period compute the RESHIWR kWh<sub>p</sub> and the RESLOWR kWh<sub>p</sub> by summing the kWh interval values separately for the RESHIWR and RESLOWR backcasted profiles (available on the Load Profiling page at [www.ercot.com](http://www.ercot.com)) corresponding to the specific days in meter reading period "p".

7. Compute the ESI ID year use, RESHIWR year use, and RESLOWR year use by summing the kWh<sub>p</sub>, RESHIWR kWh<sub>p</sub>, and RESLOWR kWh<sub>p</sub> respectively for each year value as determined in Step 3 above.

8. For each year value compute a scaled RESHIWR kWh use and a scaled RESLOWR kWh use for each meter reading.

$$S \text{ RESHIWR } kWh_p = \frac{\text{RESHIWR } kWh_p \times \text{ESIID year use}}{\text{RESHIWR year use}}$$

$$\text{RESLOWR } kWh_p \times \text{ESIID year use}$$



## Steps for Assigning a Profile Segment

$$S \text{ RESLOWR kWh}_p = \frac{\text{RESLOWR year use}}{\text{RESLOWR kWh}_p}$$

9. Determine the correlation ( $R^2$ ) to the RESHIWR and RESLOWR profiles for each ESI ID. The correlations are determined with a weighted linear regression analysis.

Each reading is weighted as follows:

If season = Winter  
 and RESLOWR kWh<sub>p</sub> > 0  
 and RESHIWR kWh<sub>p</sub> > RESLOWR kWh<sub>p</sub> then  
 weight<sub>p</sub> = 2(RESHIWR kWh<sub>p</sub> / RESLOWR kWh<sub>p</sub>)  
 else weight<sub>p</sub> = 1

$$R^2 = 1 - (SSE / TSS)$$

where  $SSE = \sum w_i (y_i - B_1 x_i)^2$

$$TSS = \sum w_i y_i^2$$

$$B_1 = \frac{\sum w_i x_i y_i}{\sum w_i x_i^2}$$

$w_i$  = weight<sub>p</sub>  
 $y_i$  = kWh<sub>p</sub>  
 $x_i$  = S RESHIWR kWh<sub>p</sub> or S RESLOWR kWh<sub>p</sub>

10. Identify the Winter Max ADUse<sub>p</sub> for each ESI ID for the entire usage time period.

11. For each ESI ID, assign either HIWR (High Winter Ratio) or LOWR (Low Winter Ratio) based on the results of the previous steps, as follows. Because A thru D below are not mutually exclusive, it is necessary to step through each of the following in the order listed, for each ESI ID, until an applicable case is found. (Please note that the breakpoint values below are subject to change periodically.)

If the ESI ID's Winter Max ADUse<sub>p</sub> < 20 kWh/day then assign LOWR  
 else if the ESI ID's correlation to the RESHIWR profile > 0.60  
 and the correlation to the RESHIWR profile > correlation to the RESLOWR profile  
 then assign HIWR  
 else if the number of readings available > 9  
 and the correlation to the RESHIWR profile > 0.90  
 and (the correlation to the RESHIWR profile + 0.009) > the correlation to the RESLOWR  
 and Winter Max ADUse<sub>p</sub> > 53 kWh/day then assign HIWR  
 else assign LOWR

C. For each ESI ID with a meter data type of IDR, perform the following.

1. Determine a list of ESI IDs that were active on January 1 of the year two years prior to the current year.

2. Calculate two variables for each day on which the ESI ID is active and for which the actual interval data is available for the following months.

January of the current year	February of the current year
January of the previous year	February of the previous year
January from two years ago	February from two years ago

The two variables are:

- Daily kWh; and
- Average Weather Zone daily dry bulb temperature.

## Steps for Assigning a Profile Segment

ESI IDs must have at least 90% of the total monthly intervals for all six months to proceed to step 3.

3. Calculate R-square (Pearson Product Moment Coefficient of Determination) values between these two variables, for each of the six months listed above.

4. For each ESI ID, assign the appropriate Profile Segment based on A thru B below.

- a. If the existing assignment is LOWR (or a DG variation such as LOPV) then  
if the required data were not available to calculate R-square values for *any* of the six months then  
do not change assignment;  
else if *any three* of the six R-square values is  $\geq 0.6$  then  
assign HIWR;  
else do not change assignment.
- b. If the existing assignment is HIWR (or a DG variation) then  
if the required data were not available to calculate R-square values for *each* of the six months then  
do not change assignment;  
else if *all* of the six R-square values are  $\leq 0.4$  then  
assign LOWR;  
else do not change assignment.

D. Assign a DG Profile Segment as directed by ERCOT, per the DG tab.

1. If the ESI ID has any PV generation then  
if segment is determined to be HIWR then assign HIPV;  
else if segment is determined to be LOWR then assign LOPV;
2. Else if the ESI ID has wind generation then  
if segment is determined to be HIWR then assign HIWD;  
else if segment is determined to be LOWR then assign LOWD;
3. Else if the ESI ID has other DG then  
if segment is determined to be HIWR then assign HIDG;  
else if segment is determined to be LOWR then assign LODG.

### III. Business (BUS)

**Assignment Year for Average Load Factor calculations: July of the previous calendar year through June of the current calendar year**

For each ESI ID, assign the applicable Profile Segment based on the steps below. Because the steps below are not mutually exclusive, it is necessary to step through each of the following in the order listed, for each ESI ID, until an applicable case is found. Once an applicable case has been found follow the instructions in 'E' below for ESI IDs that have Distributed Generation (per the DG tab).

A. Assign the IDRRQ ('IDR required') Profile Segment to all BUS ESI IDs required to have an IDR Meter, per Section 18 of the ERCOT Nodal Protocols.

B. Assign the OGFLT (Oil & Gas Flat) Profile Segment to:  
ESI IDs for which ERCOT has informed the TDSP that OGFLT should be assigned per the Oil & Gas tab.

C. Assign the NODEM Profile Segment for:  
1. BUS ESI IDs that have a kWh meter, but the meter does not measure and retain a kW value; or  
2. BUS ESI IDs for which a demand value is measured but the value is not sent to ERCOT, per Nodal Protocols Section 10.3.3.1. ESI IDs that receive service at transmission voltage ( $> 60$  kV) or are otherwise subject to the IDR requirement shall be assigned the IDRRQ Profile Segment.

D. Determine the Average Load Factor (AvgLF) for ESI IDs that were not assigned a Profile Segment in Steps 1, 2, or 3 above.

1. Determine Usage Month values (ActiveDays<sub>m</sub>, kWDays<sub>m</sub>, kWh<sub>m</sub>, MaxkW<sub>m</sub>, and ADUse<sub>m</sub>) for each ESI ID for the 12 months of the Assignment Year, which is listed near the beginning of Section III.

## Steps for Assigning a Profile Segment

2. Compute the Average Hourly Usage (AHUse<sub>m</sub>) for the Usage Months of the Assignment Year.

$$AHUse_m = \left( \frac{kWh_m}{ActiveDays_m \times 24} \right)^*$$

where kWh<sub>m</sub> = consumption in kilowatthours in Usage Month m, and  
ActiveDays<sub>m</sub> = Number of Active Days in Usage Month m.

\* Round to two decimal places, per the Rounding instructions on the Definitions tab.

3. Compute the Average Load Factor (AvgLF) as shown below for the Usage Months of the current Assignment Year. TDSPs that measure kVA at the ESI ID level should reference the 'kVA to kW' tab before proceeding. The Average Load Factor is a weighted average of the individual monthly load factors, where demand levels are used to define the weights (presented in a mathematically equivalent calculation below). AHUse<sub>m</sub> and MaxkW<sub>m</sub> values are required for each of the 12 months of the current Assignment Year in order to calculate AvgLF.

$$AvgLF = \frac{\left[ \sum_{m=1}^{12} AHUse_m \right]^*}{\sum_{m=1}^{12} MaxkW_m}$$

where AHUse<sub>m</sub> = Average Hourly Use in Usage Month m as previously defined, and  
MaxkW<sub>m</sub> = Maximum metered kW Demand in Usage Month m, as defined on the Usage Month methodology tab.

\* Round to two decimal places, per the Rounding instructions on the Definitions tab.

4. For each ESI ID, assign the appropriate Profile Segment based on A thru G below. Because A thru G below are not mutually exclusive, it is necessary to step through each of the following in the order listed, for each ESI ID, until an applicable case is found. (Please note that the breakpoint values below are subject to change periodically.)

- a. If there is no existing assignment then
  - if the required data were not available to calculate the AvgLF\*\* then assign MEDLF;
  - else if data were available (e.g., for Opt-in entities) to calculate the AvgLF then
    - if the AvgLF < 0.40 then assign LOLF;
    - else if 0.40 ≤ AvgLF ≤ 0.60 then assign MEDLF;
    - else assign HILF.
  
- b. If the existing assignment is LOLF (or a DG variation, such as LOWD) then
  - if the required data were not available to calculate the AvgLF\*\* then do not change assignment from LOLF;
  - else if the AvgLF < 0.40 then do not change assignment from LOLF;
  - else if 0.40 ≤ AvgLF ≤ 0.60 then assign MEDLF;
  - else assign HILF.
  
- c. If the existing assignment is MEDLF (or a DG variation) then
  - if the required data were not available to calculate the AvgLF\*\* then do not change assignment from MEDLF;
  - else if the AvgLF < 0.40 then assign LOLF;
  - else if 0.40 ≤ AvgLF ≤ 0.60 then do not change assignment from MEDLF;
  - else assign HILF.

## Steps for Assigning a Profile Segment

- d. If the existing assignment is HILF (or a DG variation) then
  - if the required data were not available to calculate the AvgLF\*\* then do not change assignment from HILF;
  - else if the AvgLF < 0.40 then assign LOLF;
  - else if  $0.40 \leq \text{AvgLF} \leq 0.60$  then assign MEDLF;
  - else do not change assignment from HILF.
  
- e. If the existing assignment is IDRRQ then
  - if the required data were not available to calculate the AvgLF\*\* then assign MEDLF;
  - else if the AvgLF < 0.40 then assign LOLF;
  - else if  $0.40 \leq \text{AvgLF} \leq 0.60$  then assign MEDLF;
  - else assign HILF.
  
- f. If the existing assignment is NODEM (or a DG variation) then
  - if the required data were not available to calculate the AvgLF\*\* then assign MEDLF;
  - else if the AvgLF < 0.40 then assign LOLF;
  - else if  $0.40 \leq \text{AvgLF} \leq 0.60$  then assign MEDLF;
  - else assign HILF.
  
- g. If the existing assignment is neither LOLF, MEDLF, HILF, IDRRQ, nor NODEM
  - if the required data were not available to calculate the AvgLF\*\* then assign MEDLF;
  - else if the AvgLF < 0.40 then assign LOLF;
  - else if  $0.40 \leq \text{AvgLF} \leq 0.60$  then assign MEDLF;
  - else assign HILF.

\*\* or if the mathematical calculation of the AvgLF is undefined due to a zero (0) in the denominator

### E. Assign a DG Profile Segment as directed by ERCOT, per the DG tab.

1. If the ESI ID would otherwise be assigned IDRRQ then assign IDRRQ;
  
2. Else if the ESI ID has any PV generation then
  - if segment is determined to be HILF then assign HIPV;
  - else if segment is determined to be MEDLF then assign MEDPV;
  - else if segment is determined to be LOLF then assign LOPV;
  - else if segment is determined to be NODEM then assign NODPV;
  - else if segment is determined to be OGFLT then assign OGFPV;
  
3. Else if the ESI ID has wind generation then
  - if segment is determined to be HILF then assign HIWD;
  - else if segment is determined to be MEDLF then assign MEDWD;
  - else if segment is determined to be LOLF then assign LOWD;
  - else if segment is determined to be NODEM then assign NODWD;
  - else if segment is determined to be OGFLT then assign OGFWD-;
  
4. Else if the ESI ID has other DG then
  - if segment is determined to be HILF then assign HIDG;
  - else if segment is determined to be MEDLF then assign MEDDG;
  - else if segment is determined to be LOLF then assign LODG;
  - else if segment is determined to be NODEM then assign NODDG;

## Steps for Assigning a Profile Segment

else if segment is determined to be OGFLT then assign OGFDD.

**ERCOT Load Profiling Guide**  
**Appendix D: Profile Decision Tree**

June 1, 2013

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## **Appendix D**

### **Profile Decision Tree**

**See electronic Microsoft Office Excel© file on the ERCOT Website posted with the Load Profiling Guide**

# **ERCOT Load Profiling Guide**

## **Appendix E: Load Profile Model Spreadsheets**

September 1, 2011

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## **Appendix E**

### **Load Profile Model Spreadsheets**

**See electronic Microsoft Office Excel© files on the ERCOT Website posted with the Load Profiling Guide.**

These files are a representation of the Load Profile Models used in settlements.