ERCOT Load Profiling Guide

June 29, 2007

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

May 1, 2007

1 Introduction

1.1 Document Control

Authorities

Prepared by	Role	Date Completed
ERCOT Load Profiling Working Group		

Reviewed by	Role	Date Authorized

Distribution List

Name	Organization
ERCOT Load Profiling Working Group	Commercial Operations Sub-committee/Technical Advisory Committee

Change History

Issue	Reason for issue	Date
Section 11	LPGRR2003-002	05/19/03
Section 16	LPGRR2003-001	07/29/03
Section 12	LPGRR2003-003	03/02/04
Section 12	LPGRR2003-004	03/02/04
Section 17	LPGRR2005-001	05/17/05
Section 9	LPGRR2005-005	11/01/05
Section 11	LPGRR2005-008	12/01/05
Section 1, 2, 4, 10, 12, Acronyms, Appendix A	LPGRR2006-009	05/01/06

Issue	Reason for issue	Date
Section 9, 11, 14, 17, Glossary	LPGRR2006-010	05/01/06
Section 9, 11	LPGRR2006-011	05/04/06
Section 2, Appendix A	LPGRR2006-012	08/01/06
Section 11	LPGRR2006-013	08/01/06
Section 9, Appendix D	LPGRR2006-014	08/01/06
Section 8	LPGRRR2006-015	08/01/06
Section 17	LPGRR2006-007	09/01/06
Section 8, 12, and Appendix E	LPGRR2006-016	01/01/07
Appendix E	LPGRR2007-019	04/01/07
Sections 9, 11, and Appendix D	LPGRR2007-017	05/01/07
Appendix D	LPGRR2007-018	05/01/07
Section 1, 2, and Acronyms and Glossary	LPGRR2007-021	05/01/07

1.2 Document Purpose

The purpose of these Electric Reliability Council of Texas (ERCOT) Load Profiling Guides (LPG) is to explicate the language and intent in the ERCOT Protocols that affect Load Profiling. Where no quantitative criteria are specified in the LPG, explicit thresholds that shall trigger changes shall be determined with market experience.

Specific practices described in these Guides for the ERCOT System are consistent with the North American Electric Reliability Corporation (NERC) Operating Policies and the ERCOT Protocols. In the event of any conflict between these Guides and state law, PUCT rules, or the ERCOT Protocols, such conflict shall be resolved in favor of the applicable law, rules, or Protocols.

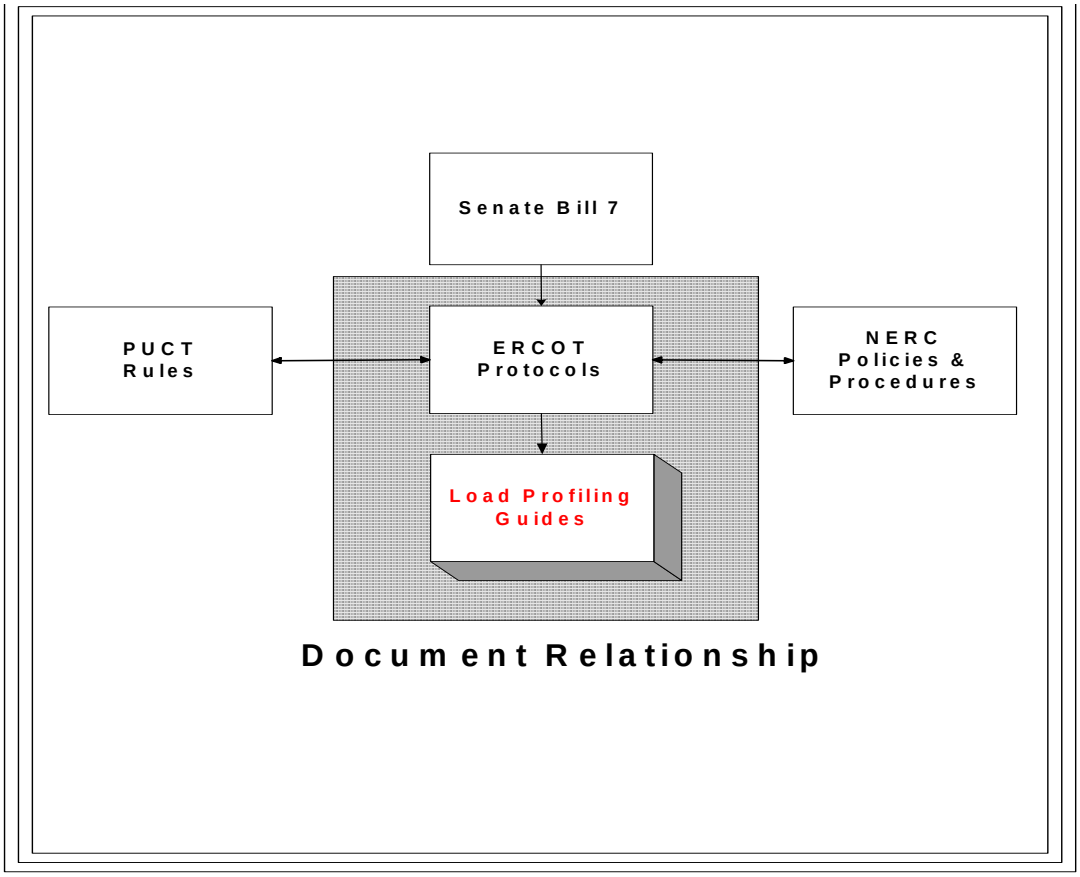
Reference: Protocols, Section 5.2.1, "Operating Standards"

These Protocols shall control to the extent of any inconsistency between the Protocols and any of the following documents:

1. *Any reliability guides applicable to ERCOT, including the Operating Guides;*
2. *The NERC Operating Manual and ERCOT procedures manual, supplied by NERC and ERCOT, respectively, as references for dispatchers to use during normal and emergency operations of the ERCOT Transmission Grid;*
3. *Specific operating procedures, submitted to ERCOT by individual transmission Facility owners or operators to address operating problems on their respective grids that could affect operation of the interconnected ERCOT Transmission Grid; and*
4. *Guidelines established by the ERCOT Board, which may be more stringent than those established by NERC for the secure operation of the ERCOT System.*

1.3 Document Relationship

The relationship of these Operating Guides to other documents is defined in the following diagram:



Document Relationship

These Load Profiling Guides are derived from the ERCOT Protocols and the NERC Policies and Procedures. Furthermore, the Public Utility Commission of Texas (PUCT) defines additional requirements for the ERCOT Control Area Authority and connected entities.

PUCT requirements and directives and the ERCOT Protocols supersede these Guides. NERC Policies and Procedures, with the exception of the specific modifications defined in these Guides shall also be followed.

ERCOT Load Profiling Guide
Section 2: Load Profiling Guide (LPG) Revision Process

May 1, 2007

2 Load Profiling Guide (LPG) Revision Process

2.1 Introduction

1. A request to make additions, edits, deletions, revisions, or clarifications to the Load Profiling Guide (LPG), including any attachments and exhibits to the LPG, is called a "Load Profiling Guide Revision Request" (LPGRR). Except as specifically provided in other Sections of the LPG, this Section shall be followed for all LPGRRs. ERCOT Members, Market Participants, Public Utility Commission of Texas (PUCT) Staff, ERCOT Staff, 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 the LPG, except for good cause shown to the PUCT or other Governmental Authority.
2. All decisions of the Profiling Working Group (PWG), as defined below, the Commercial Operations Subcommittee (COPS), the Technical Advisory Committee (TAC) and the ERCOT Board with respect to any LPGRRs shall be posted to the Market Information System (MIS) within three (3) Business Days of the date of the decision. All such postings shall be maintained on the MIS for at least 180 days from the date of posting.
3. The "next regularly scheduled meeting" of the PWG, COPS, TAC, or the ERCOT Board shall mean the next 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.
4. 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 Protocol Revision.
5. ERCOT Staff may make non-substantive corrections at any time during the processing of a particular LPGRR. Non-substantive corrections include typos (excluding grammatical changes), internal references (including table of contents), improper use of acronyms, and 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.
6. ERCOT Staff may make non-substantive corrections using an Administrative LPGRR. ERCOT shall post such Administrative LPGRRs to the MIS and distribute the LPGRR to the PWG at least ten (10) Business Days before or upon implementation. If no interested party

submits comments to the Administrative LPGRR, ERCOT Staff shall implement the Administrative LPGRR according to Section 2.7, Revision Implementation. If any interested party submits comments to the Administrative LPGRR, then the Administrative LPGRR shall be processed in accordance with the LPGRR process outlined in this Section.

2.2 Submission of Load Profiling Guide Revision Requests (LPGRR)

The following Entities may submit a LPGRR:

1. Any Market Participant (MP);
2. Any Entity that is an ERCOT Member;
3. PUCT Staff;
4. ERCOT Staff; and
5. Any other Entity who resides (or represent residents) in Texas or operates in the ERCOT Region.

2.3 Profiling Working Group (PWG)

1. COPS shall assign a working group ("Profiling Working Group" or “PWG”) to review and recommend action on formally submitted LPGRRs. COPS may create such a working group or assign the responsibility to an existing working group, provided that:
    (a) Such working group’s meetings are open to ERCOT Staff, ERCOT Members, Market Participants, and the PUCT Staff; and
    (b) Each Market Segment is allowed to participate.
2. Where additional expertise is needed, the PWG may request that COPS refer the LPGRR to existing 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 shall be submitted by the chair or the chair’s designee on behalf of the commenting subcommittee, working group or task force as comments on the LPGRR for consideration by PWG. However, the PWG shall retain ultimate responsibility for the processing of all LPGRRs.
3. The PWG shall ensure that the 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 an ERCOT Protocol Revision Request (PRR) if such a change is necessary to accommodate a proposed LPGRR prior to proceeding with that LPGRR.

4. ERCOT shall consult with the chair of the PWG to coordinate and establish the meeting schedule for the PWG or other assigned subcommittees. 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 to the MIS.

2.4 Load Profiling Guide Revision Procedure

2.4.1 Review and Posting of Load Profiling Guide Revision Requests (LPGRR)

1. LPGRRs shall be submitted electronically to ERCOT by completing the designated form provided on the MIS. 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;
    (b) Reason for the suggested change;
    (c) 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;
    (d) LPGRR Impact Analysis (IA) (applicable only for a LPGRR submitted by ERCOT Staff);
    (e) List of affected LPG Sections and subsections;
    (f) General administrative information (organization, contact name, etc.); and
    (g) Suggested language for requested revision.
3. ERCOT shall evaluate the LPGRR for completeness and shall notify the submitter within five (5) 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 revision requested, a submitter must submit a completed version of the LPGRR with the deficiencies corrected.

4. If a submitted LPGRR is complete or once a LPGRR is corrected, ERCOT shall post the complete LPGRR to the MIS and distribute the LPGRR to PWG within three (3) Business Days.

2.4.2 Withdrawal of a Load Profiling Guide Revision Request (LPGRR)

1. By providing notice to PWG, the submitter of a LPGRR may withdraw the LPGRR at any time prior to a recommendation for approval of the LPGRR by the PWG. ERCOT shall post a notice of the submitter's withdrawal of a LPGRR on the MIS within one (1) Business Day of the submitter's notice to PWG.
2. The submitter of a LPGRR may request withdrawal of a LPGRR after a recommendation for approval by PWG. Such withdrawal must be approved by COPS (if it has not yet been considered by COPS) or by TAC (if it has been recommended for TAC approval by COPS, but not yet considered by TAC).
3. Once approved by TAC, a LPGRR cannot be withdrawn.

2.4.3 Profiling Working Group (PWG) Review and Action

1. Any interested party may comment on the LPGRR.
2. To receive consideration, comments must be delivered electronically to ERCOT in the designated format provided on the MIS within twenty-one (21) days from the posting date of the LPGRR. Comments submitted after the due date of the twenty-one (21) day comment period may be considered at the discretion of PWG after these comments have been posted. Comments submitted in accordance with the instructions on the MIS, regardless of date of submission, shall be posted to the MIS and distributed electronically to the PWG within three (3) Business Days of submittal.
3. The PWG shall review the LPGRR at its next regularly scheduled meeting after the end of the twenty-one (21) day comment period, unless the twenty-one (21) day comment period ends less than three (3) Business Days prior to the next regularly scheduled PWG meeting. In that case, the LPGRR will be reviewed at the next regularly scheduled PWG meeting. At such meeting, the PWG may take action on the LPGRR to:
    (a) Recommend approval as submitted or modified;
    (b) If no consensus can be reached, present options for COPS consideration;
    (c) Recommend rejection;
    (d) Defer action on the LPGRR; or

(e) Request that COPS refer the LPGRR to another subcommittee, working group, or task force.

4. Within three (3) Business Days after PWG takes action (other than deferral), ERCOT shall issue a report ("PWG Recommendation Report") to COPS reflecting the PWG's action and post the same to the MIS. The PWG Recommendation Report shall contain the following items:
   (a) Identification of submitter;
   (b) Revised LPG language, when appropriate;
   (c) Identification of authorship of comments;
   (d) Proposed effective date(s) of the LPGRR;
   (e) Recommended action; and
   (f) Recommended priority and rank for any LPGRRs requiring a change to ERCOT's computer systems.

2.4.4 Comments to the Profiling Working Group (PWG) Recommendation Report

1. Any interested party may comment on the PWG Recommendation Report. To receive consideration, comments on the PWG Recommendation Report must be delivered electronically to ERCOT in the designated format provided on the MIS. Comments received regarding the PWG Recommendation Report after three (3) Business Days prior to the next regularly scheduled PWG meeting may be considered at the discretion of the PWG chair.
2. Within three (3) Business Days of receipt of comments related to the PWG Recommendation Report, ERCOT shall post such comments to the MIS. The comments shall include identification of the commenting Entity.
3. Comments submitted in accordance with the instructions on the MIS, regardless of date of submission, shall be posted to the MIS and distributed electronically to the PWG within three (3) Business Days of submittal.

2.4.5 Impact Analysis for a Load Profiling Guide Revision Request (LPGRR)

1. ERCOT shall complete an IA based on the submitted PWG Recommendation Report and will report the IA's results to PWG at the next regularly scheduled PWG meeting.
2. The IA shall include:
   (a) An estimate of any cost and budgetary impacts to ERCOT;
   (b) The estimated amount of time required to implement the proposed LPGRR;

(c) The identification of alternatives to the original proposed language that may result in more efficient implementation; and

(d) The identification of any manual workarounds that may be used as an interim solution.

2.4.6 Profiling Working Group (PWG) Review of Impact Analysis

1. After ERCOT posts the results of the IA, PWG shall review the IA at its next regularly scheduled meeting. PWG may revise its PWG Recommendation Report after considering the information included in the IA.
2. If PWG revises the PWG Recommendation Report, a revised PWG Recommendation Report shall be issued by PWG to COPS and posted on the MIS. Additional comments received regarding the revised PWG Recommendation Report shall be accepted up to three (3) Business Days prior to the COPS meeting at which the LPGRR is scheduled for consideration. If PWG revises its recommendation, ERCOT shall update the IA and issue the updated IA at least three (3) Business Days prior to the regularly scheduled COPS meeting. If a longer review period is required for ERCOT Staff to update the IA, ERCOT Staff shall submit a schedule for completion of the IA to the COPS chair.

2.4.7 Commercial Operations Subcommittee (COPS) Review and Action

1. COPS shall consider any LPGRRs that PWG has submitted to COPS for consideration for which both a PWG Recommendation Report has been posted and an IA based on such PWG recommendation (as updated if modified by PWG under Section 2.4.6, Profiling Working Group Review of Impact Analysis) has been posted on the MIS for at least three (3) days. The following information must be included for each LPGRR considered by COPS:
   (a) The PWG Recommendation Report and IA; and
   (b) Any comments timely received in response to the PWG Recommendation Report.
2. COPS shall take one of the following actions regarding the PWG Recommendation Report:
   (a) Recommend approval of the LPGRR as recommended in the PWG Recommendation Report or as modified by COPS;
   (b) Reject the LPGRR; or
   (c) Remand the LPGRR to the PWG with instructions.

3. If COPS recommends approval of a LPGRR, ERCOT shall prepare a COPS Recommendation Report, issue the report to TAC and post the report on the MIS within three (3) Business Days of the COPS recommendation concerning the LPGRR. The COPS Recommendation Report shall contain the following items:
    (a) Identification of the submitter of the LPGRR;
    (b) Modified Guide language proposed by COPS;
    (c) Identification of the authorship of comments;
    (d) Proposed effective date(s) of the LPGRR;
    (e) Recommended priority and rank for any LPGRR requiring a change to ERCOT's computer systems;
    (f) PWG recommendation; and
    (g) COPS recommendation.

2.4.8 ERCOT Impact Analysis Based on Commercial Operations Subcommittee (COPS) Recommendation Report

For LPGRRs not designated Urgent, ERCOT shall review the COPS Recommendation Report and update the IA as soon as practicable, but no later than seven (7) days after the COPS Recommendation Report is issued, unless a longer period is warranted due to the complexity of the changes proposed by COPS. ERCOT shall issue the updated IA (if any) to TAC and post it on the MIS within three (3) Business Days of issuance. If a longer review period is required for ERCOT Staff to update the IA, ERCOT Staff shall submit a schedule for completion of the IA to the COPS and TAC chairs.

2.4.9 Protocol Revision Subcommittee (PRS) Review of Project Prioritization

At its next regularly scheduled meeting, the PRS shall recommend to TAC an assignment of Project Priority for each LPGRR recommended for approval by COPS that requires a change to ERCOT's computer systems.

2.4.10 Technical Advisory Committee (TAC) Review and Action

1. Upon recommendation for approval of a LPGRR by COPS and issuance of an IA by ERCOT to TAC, the TAC shall review the COPS Recommendation Report and the IA at its next regularly scheduled meeting; provided that the IA is available for distribution to the TAC at least seven (7) days in advance of the TAC meeting.
2. The TAC shall take one of the following actions regarding the COPS Recommendation Report:
    (a) Approve the COPS Recommendation Report as originally submitted or as modified by the TAC;

(b) Reject the COPS Recommendation Report; or

(c) Remand the COPS Recommendation Report to COPS with instructions.

3. If the COPS Recommendation Report is approved by the TAC, as recommended by COPS or modified by the TAC, the TAC shall review and approve or modify the proposed effective date.
4. If TAC approves as submitted, approves as modified, or rejects a LPGRR, ERCOT shall prepare a TAC Action Report and post it on the MIS within three (3) Business Days of the TAC decision. The TAC Action Report shall contain the following items:
   (a) Identification of the submitter of the LPGRR;
   (b) Identification of the authorship of comments;
   (c) Proposed effective date(s) of the LPGRR;
   (d) Procedural history;
   (e) COPS' recommendation; and
   (f) TAC Action (or recommendation to the Board for LPGRRs requiring changes to ERCOT's computer system);
5. TAC shall consider the project priority of each LPGRR requiring a change to ERCOT's computer systems and make recommendations to the ERCOT Board.
6. The chair of TAC 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 Review and Action

The ERCOT Board shall review all LPGRRs which impact ERCOT systems or staffing. The ERCOT Board shall take one of the following actions regarding LPGRRs recommended by TAC which have such impacts:

1. Approve the TAC recommendation as originally submitted or as modified by the ERCOT Board; or
2. Reject the TAC recommendation; or
3. Remand the TAC recommendation to TAC with instructions.

2.5 Appeal of Decision

1. With reference to a decision by PWG, any interested party may appeal directly to the COPS. Such appeal to the COPS must be submitted to ERCOT within ten (10) Business Days after the date of the relevant decision. Appeals made after this time shall be rejected. Appeals to the COPS shall be posted on the MIS within three (3) Business Days and placed on the agenda of the next regularly scheduled COPS meeting,

provided that the appeal is provided to ERCOT at least eleven (11) days in advance of the COPS meeting; otherwise the appeal will be heard by the COPS at the next regularly scheduled COPS meeting.

2. With reference to a decision by COPS, any interested party may appeal directly to the TAC. Such appeal to the TAC must be submitted to ERCOT within ten (10) Business Days after the date of the relevant decision. Appeals made after this time shall be rejected. Appeals to the TAC shall be posted on the MIS within three (3) Business Days and placed on the agenda of the next regularly scheduled TAC meeting, provided that the appeal is provided to ERCOT at least eleven (11) days in advance of the TAC meeting; otherwise the appeal will be heard by the TAC at the next regularly scheduled TAC meeting.
3. With reference to a decision by TAC, any interested party may appeal directly to the ERCOT Board. Such appeal to the ERCOT Board must be submitted to ERCOT within ten (10) Business Days after the date of the relevant decision. Appeals made after this time shall be rejected. Appeals to the ERCOT Board shall be posted on the MIS within three (3) Business Days and placed on the agenda of the next available regularly scheduled ERCOT Board meeting, provided that the appeal is provided to the ERCOT General Counsel at least eleven (11) days in advance of the Board meeting; otherwise the appeal will be heard by the Board at the next regularly scheduled Board meeting.
4. Any interested party 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 thirty-five (35) days of the date of the relevant decision. If the PUCT or other Governmental Authority rules on the LPGRR, ERCOT shall post the ruling on the MIS.

2.6 Urgent Requests

1. The party submitting a LPGRR may request that the LPGRR be considered on an urgent basis. COPS may designate the LPGRR for urgent consideration. The urgent LPGRR and Impact Analysis (if available) shall be considered at the earliest regularly scheduled PWG or COPS meeting , or at a special meeting called by the PWG or COPS chair to consider the urgent LPGRR if the regularly scheduled meeting will not take place within fourteen (14) days.
2. If the submitter desires to further expedite processing of the LPGRR, a request for COPS to vote via electronic mail may be submitted to the COPS chair. The COPS chair may grant the request for voting via electronic mail. Such voting shall be conducted pursuant to TAC procedures. If COPS recommends approval, ERCOT shall submit a

COPS Recommendation Report to the TAC within three (3) Business Days after COPS takes action. The TAC chair may request action from TAC to accelerate or alter the procedures described herein, as needed, to address the urgency of the situation.

3. Notice of an urgent LPGRR pursuant to this subsection shall be posted on the MIS.

2.7 Revision Implementation

1. For LPGRRs with no impact to ERCOT systems or staffing, upon TAC approval, ERCOT shall implement LPGRRs on the first day of the month following TAC approval, unless otherwise provided in the TAC Action Report for the approved LPGRR.
2. For LPGRRs with impacts to ERCOT systems or staffing, upon Board approval, ERCOT shall implement LPGRRs on the first day of the month following Board approval, unless otherwise provided in the Board Action Report for the approved LPGRR.
3. ERCOT shall implement an Administrative LPGRR on the first day of the month following the end of the ten (10) Business Day posting requirement outlined in Section 2.1, Introduction.

ERCOT Load Profiling Guide
Section 3: Purpose of Load Profiling

September 1, 2006

3 Purpose of Load Profiling

Load Profiling within the ERCOT market is the practice of estimating fifteen (15) minute interval load usage 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 Profiles' contribution to Unaccounted for Energy (UFE) by the Load Profile over all Settlement Intervals and that no unfair advantage is given to any Market Participant.

Since most customers within the market are not equipped with Interval Data Recorders (IDRs), Load Profiling is used to estimate a customer's interval load in a cost-effective and expeditious manner. For these customers to participate in the retail market, Load Profile Models are used to estimate their fifteen (15) minute interval load. In addition, Load Profiling estimates the interval load usage for IDR metered loads when the IDR data is unavailable.

ERCOT Load Profiling Guide
Section 4: The Profiling Working Group

September 1, 2006

4 The Profiling Working Group

The ERCOT 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 PWG

The PWG is a forum in which ERCOT 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 Guides (LPG). The PWG shall be involved in all policy issues and some operational aspects of Load Profiling in the ERCOT market.

4.2 PWG Responsibilities

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

- Maintains and upholds Protocols Section 18, “Load Profiling,”
- Reviews all requests for changes to Load Profiles, Load Profiling Methodologies, and implementation of the Load Profiling process;
- Reviews and makes recommendations to COPS regarding LPG change control, Load Profile Models, and Load Profile Methodologies;
- Reviews and makes recommendations to the Profile Decision Tree;
- Participates in defining Weather Zones and Load Profile types;
- Evaluates the validation and assignment processes for Load Profile IDs;
- Evaluates the impact of the Interval Data Recorder (IDR) requirement for possible revision prior to competitive metering;
- Periodically reviews the selected profiling technique for Time-of-Use (TOU);
- Coordinates with ERCOT in developing Load Profiles for particular customer segments that may require special Load Profiling techniques (e.g., supplemental Load Profiles);
- Develops and maintains the LPG;
- Reviews and makes recommendations to the ERCOT Load Profiling Department on load research Sample Design;
- Performs a liaison function between Market Participants and ERCOT Load Profiling Department and facilitates market acceptance of Load Profiling processes; and

- Provides a forum for Market Participants to be involved with ERCOT Load Profiling.

4.3 PWG Reporting Structure

At the time of the development of the LPG, the PWG reported to COPS, which is a standing subcommittee of Technical Advisory Committee (TAC). The PWG Chair and PWG Vice Chair are elected annually by the PWG on a calendar year basis. The Chair leads the PWG meeting, establishes 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.

To obtain current reporting structure information, please refer to the following website: http://www.ercot.com/committees/index.html .

4.4 PWG Membership

The PWG membership is open to all Market Participants and any other interested parties (e.g., consultants, Non-Opt In Entities (NOIEs), future Market Participants, PUCT staff). All Market Participants are invited to attend all PWG meetings.

4.5 PWG Contact Information

To receive electronic mail related to the Profiling Working Group (PWG), contact postmaster@ercot.com and request to be placed on the mailing list of profiling@ercot.com. Include your name, your company's name, your electronic mail address, and your telephone number in the electronic mail.

To discontinue receiving electronic mail related to the Profiling Working Group (PWG), contact postmaster@ercot.com and request to be removed from the mailing list of profiling@ercot.com. Include your name, your company's name, your electronic mail address, and your telephone number in the electronic mail.

The ERCOT Load Profiling Department may also assist with contact information.

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

September 1, 2006

5 Guidelines for Load Profile Development

This section of the Load Profiling Guides (LPG) specifies guidelines that shall be used in the development of Load Profiles used in the ERCOT market.

5.1 Background

The Profiling Working Group (PWG) established high-level principles to be utilized in the development of Load Profiles. These principles are specified in Protocols Section 18.2.1, "Guidelines for Development of Load Profiles."

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 the Load Profiles for Market Open. These guidelines should be considered in future Load Profile development.

1. 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 geographic/climatological area and analyze opportunities for using one Load Profile to represent more than one existing class load shape.
2. 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:
    (a) What extent do the existing Load Profiles represent homogeneous groups with respect to load shape and supply costs?
    (b) What extent does 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?
3. The assignment of Load Profiles to areas that do not currently have load research data available shall be based on the following issues:
    (a) What separate customer groups are currently recognized for the area requiring a Load Profile (e.g., rate classes)?
    (b) What load shapes are available from other areas for each of these customer groups?
    (c) 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:

(i) Average kWh consumption per year or month from billing records.

(ii) For customer groups with demand metering, the annual average load factor.

(iii) 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).

(d) The geographic proximity of the areas for which load research data is available.

4. 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 Profiles 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:

   - Type of customer (residential, small commercial, large commercial, etc.);
   - Peak demand; and
   - Load factor.

   Other parameters, such as those relating to geographic location, shall be unambiguous and straightforward.

5. Where alternative load research data may 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.

6. To accommodate Time-of-Use (TOU) pricing, controlled load and other similar pricing schemes, ERCOT shall consider the following possibilities:

   (a) Where specific load research data exists for a particular group, utilize that data.

   (b) When appropriate, generic Load Profiles may be modified to approximate the consumption patterns of multiple pricing periods.

   (c) 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.

7. 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.
8. 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

September 1, 2006

6 Load Profiling Methodology

6.1 Introduction

This section of the Load Profiling Guides (LPG) describes the periodic evaluation of the Load Profiling Methodologies as specified in Protocols Section 18.2.9, "Adjustments and Changes to Load Profile Development."

The procedure to request a change to Load Profiling Methodologies is presented in Section 7, "Request for Changes to Load Profiling Methodology."

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:

- Load Profile Model Performance;
- Methodology Performance;
- Alternative Methodology Impacts to Load Profiling Issues; and
- 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:

- Unusual events that affect the ERCOT system;
- Dramatic changes in a relatively short period of time;
- Sensitivity of the methodology to random error;
- Changes to data quality; and
- 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:

- Alternative changes (e.g., changes to models), which may provide the Market Participants the desired result; and
- 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:

- No Changes to Load Profiling Methodologies;
- Modify Existing Load Profiling Methodology; and
- 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 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

September 1, 2006

7 Request for Changes to Load Profiling Methodology

This section of the Load Profiling Guides (LPG) addresses changes and modifications to the methodology used to establish Load Profiles. ERCOT Board approval is required for any methodology, not currently utilized, or to change from one approved methodology to another approved methodology to establish Load Profiles. *This section applies to requests for changes to Load Profiling Methodology; however, it **does not** address changes to profile segments or Weather Zones.*

There shall be no retroactive application of any approved modifications to Load Profiling Methodology.

Since any change to a Load Profiling Methodology has significant impacts to the competitive electric market, a request for a Load Profiling Methodology change shall not be considered until two (2) years after Market Open.

7.1 Current Methodologies

The following methodologies are used to establish Load Profiles:

Type of Load	**Load Profiling Methodology**
Non- Price-Responsive	
Non-Interval Metered	Adjusted Static Models
Non-Metered	Engineering Estimates
IDR (Estimation)	Proxy Day
Price-Responsive	
Time-of-Use	Chunking
Direct Load Control	Lagged Dynamic
Other Price-Responsive	To Be Determined

Any other profiling methodology shall require approval by appropriate Technical Advisory Committee (TAC) subcommittees and the ERCOT Board.

7.2 Who May Submit a Request

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 LPG.

7.3 Timeline for Processing a Request

A request for a profile methodology change shall not be accepted until two (2) years after Market Open. After the expiration of this initial period, requests for methodology changes may be submitted to ERCOT at any time. Within two (2) 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 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.

After the request has been presented to the PWG, ERCOT shall post the methodology request to the Market Information System (MIS) and respond to the request within sixty (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:

- Whether the request is complete;
- What additional data is required to evaluate the request, if applicable;
- How the request shall be assessed;
- An estimate of the time by which a decision on the request is expected to be ready; and
- An estimate of the implementation date of the requested change, if approved.

During ERCOT's evaluation of the request, ERCOT may request supplemental information determined to be important to fully evaluate the methodology change.

Due to the significance of a change to Load Profiling methodologies, according to Protocols Section 18.2.9, "Adjustments and Changes to Load Profile Development," a change shall only be implemented after ERCOT Board 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

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.

The submitter shall identify the following:

- The entity submitting the request;
- Contact information;
- The current methodology to be modified;
- The proposed methodology or modification(s) proposed to the current methodology; and
- The affected Load Profile segment(s) and Weather Zone(s).

The submitter shall include pertinent supporting data with the initial request to ERCOT. Examples include the following:

1. 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.
2. 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 estimation that has been performed, and describe the analysis.
3. Analysis of other data or other supporting evidence. The submitter shall document data sources and present the associated analysis.

The submitter shall also provide evidence that:

- The current profiles have substantial bias;
- The proposed alternative mitigates the problem(s);
- The change in methodology is warranted due to the severity of the problem(s) with the current profiles; and/or
- 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:

- The quality of the supporting data provided;
- The magnitude of differences indicated;
- The size of the affected population; and
- The effect on the rest of the market if the change is accepted.

7.6 Approval of the Request

ERCOT Board approval is required to implement any change to a Load Profiling Methodology in accordance with Protocols Section 18.2, “Methodology.” The request shall follow the approval sequence described in Section 12, “Request for Profile Segment Changes, Additions, or Removals.”

7.7 Costs for Load Profiling Methodology Changes

The party requesting the methodology change shall pay all costs associated with developing the supporting data and documentation submitted to ERCOT for evaluation.

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 TDSP.

7.8 Procedure for Submitting a Request

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.

ERCOT Load Profiling Guide
Section 8: Load Profile Models

January 1, 2007

8 Load Profile Models

Protocol Section 18.2.9, "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. The section also includes guidelines for ERCOT's ongoing evaluation of profile segment definitions and Weather Zones. Changes to Adjusted Static Models and changes to engineering profiles are also addressed.

The Excel© representation of the ERCOT Load Profile Models can be found in Appendix E, Load Profile Model Spreadsheets of the Load Profiling Guide.

There shall be no retroactive application of any approved modifications to Load Profile Models.

This section discusses changes to profile models not addressed in the following Load Profiling Guides (LPG) sections:

- Section 7, "Request for Changes to Load Profiling Methodology"
- Section 12, "Request for Profile Segment Changes, Additions, or Removals"
- Section 13, "Changes to Weather Zone Definitions"

Where no quantitative criteria are specified in the LPG, explicit thresholds that shall trigger changes shall be determined with market experience.

8.1 Routine and Non-Routine Profile Model Evaluations

ERCOT shall perform evaluations of profile model performance, which shall include both routine and non-routine evaluations.

8.1.1 Routine Evaluation of Model Performance

ERCOT shall conduct a routine annual evaluation of model performance for all models, 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

Between the annual evaluations, ERCOT may evaluate specific requests for changes to 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 Profile Segment Changes, Additions, or Removals,” for profile segments, and in Section 13, “Changes to Weather Zone Definitions,” for Weather Zones.

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 (MP), TAC subcommittee, or at ERCOT’s initiative.

8.2 Evaluation of Profile Models Using Current Load Research Data

8.2.1 Sources of Load Research Data

Load research data may be obtained from ERCOT developed Load research samples and from any available 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.”

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 profile models against current Load research data consists of the following:

Assignment to Profile Segments

Assign each sample site in the current Load research sample to the appropriate profile segment and Weather Zone. The expansion weight for each sampled site shall be determined using sound statistical practice.

Expansion

For each profile segment and each Weather Zone, use the appropriate expansion methodology and weight to expand the sample data assigned to the segment and Weather Zone. The results of the expansion profiles are expressed as average Load per Customer for each interval.

Comparison
For each profile segment and each Weather Zone, compare the profile estimates developed from the Load research sample data to the profile estimates from the profile models. The 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 current Load research data are not available for a particular Weather Zone and profile segment, no such comparison is made for that Weather Zone and segment.

If the current Load research data represent only a portion of a particular Weather Zone, the modeled 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 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 profile models.

8.2.4 Factors Considered in Comparisons

In all the factors below, the profile based on the current Load research data is treated as the proposed profiles and the profile based on the current model is treated as the existing 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 profiles are referred to as "Target Profiles" and existing 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 profile based on the new Load research data, and using the 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 (2) Load Profiles.

8.2.4.2 On-Peak/Off-Peak Ratio

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

8.2.4.3 Load Factor

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

8.2.4.4 Summary Statistics on Differences Between Series

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:

- Unitized load;
- Monthly fractions;
- Daily fractions; and
- Clock-hour fractions.

Each of these series may be calculated for the profile based on new Load research data and for the profile based on the current model.

The difference between the proposed and existing series is then measured in terms of one of the following summary statistics:

- Mean difference;
- Mean absolute percent error;
- Mean absolute deviation; or
- Root mean square error.

8.2.4.5 Deadweight Loss

In the terminology used in Appendix C, "Measuring Differences Between Load Profiles," the Load Profile representing the proposed segment is the "Target Profile."

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 ESI ID "actual" Load shapes. This loss is a societal cost, measured in dollars per year. Revising the current profile to bring it closer to the Target Profile would reduce societal deadweight loss by at most this amount.

8.3 Evaluating Profile Models without Current Load Research Data

8.3.1 Applications

In many situations, current Load research data are not available as a basis for assessing the adequacy of profile models. In these cases, other assessment

techniques are used. Situations where techniques are required that do not depend on Load research data include:

1. Assessing model performance for geographic areas where load research data are no longer collected;
2. Assessing model performance for geographic areas where load research data have never been collected, or have not contributed to current models;
3. Assessing Engineering Estimates.

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 Profile Model Comparisons

8.3.2.1 Comparisons for Adjusted Static Models

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 profile segment.

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 Profile Segment Changes, Additions, or Removals."

8.3.2.2 Examination of Monthly Patterns

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:

1. Sum the consumption data for each ESI ID in the period under study (normally 12 monthly reads) to produce annual consumption totals for that ESI ID
2. Calculate the reading fraction for each of the ESI ID's readings by dividing the monthly reading by the annual consumption total.
3. Compute the comparable reading fraction for the Load Profile of the segment or subgroup under study.
4. Compare the reading fractions from Step 2 with the reading fractions from Step 3 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.”

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 profile may be compared to consumption data aggregated across Weather Zones. Procedures for calculating an aggregate segment profile across Weather Zones are described in Section 8.2.2, “Procedures.”

8.3.2.3 Comparisons for Engineering Estimates

Engineering Estimates are used in the ERCOT market only for non-metered loads, such as lighting. 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 on operating schedules for the ESI IDs in a profile segment using an engineering profile, this information may be compared with the assumptions of the estimate.

Monthly consumption data may also be compared with the profile monthly patterns using the methods described above for Adjusted Static Models.

8.3.2.4 Unaccounted for Energy (UFE) by Area

At Market Open, UFE is calculated only at the system-wide level. This calculation may be performed at a finer geographic level. If UFE is available at a finer level, this information may provide indicators of possible problems with Load Profiles. Such an exploration may be particularly valuable for areas that do not have Load research data contributing to Load Profile models. However, UFE patterns may also indicate systematic problems with loss factors or with data transfer. Therefore, UFE patterns are only one factor to be considered in assessing model performance.

8.4 Routine Profile Model Evaluations

Routine annual evaluation of model performance may include the following components using the procedures described in Section 8.2, “Evaluation of Adjusted Static Profile Models Using Current Load Research Data” and Section 8.3, “Evaluating Profile Models without Current Load Research Data.”

- For each adjusted static profile segment and Weather Zone where current load research samples exist, compare the profile based on current Load research samples with the profile based on the current model.

- For each adjusted static profile segment, 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.
- For each engineering profile segment, consider whether any current data are available that would indicate substantial differences in operating schedules from those assumed in the engineering models.
    - Possible sources of data on operating schedules and equipment saturations include:
        - Regional data on equipment and operating hours from end-use consumption surveys published by the Energy Information Administration
        - Regional or state data on operating practices published by the Census Bureau
        - Economic data published by Texas state or local agencies
        - Saturation or other studies by Market Participants, if available.
    - 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.
- Review the magnitude of Load migrated into and out of each Load Profiling segment since the time the Load research data were collected.
- For each adjusted static profile segment and Weather Zone, compare the patterns in current aggregate monthly consumption data with the monthly pattern of the current Load Profile model.

If 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. Only National Oceanic and Atmospheric Administration (NOAA) First or Second order weather stations are used by ERCOT for obtaining weather data for each Weather Zone. Assessment steps of the evaluation of each Weather Zone shall be determined as the market matures. Steps may include the following:

1. Calculate each current segment profile using each Weather Zone's model coefficients together with the current weighted average weather data for the Weather Zone.
2. Calculate weather station segment profiles. Apply each profile segment model to weather data from each weather station, using the model coefficients for the Weather Zone that includes that weather station.
3. Assign each zip code to the closest weather station.
4. For each weather station and adjusted static segment, calculate the total annual energy for ESI IDs in zip codes assigned to the station.
5. Multiply each weather station segment profile by the annual consumption from Step 4.
6. Sum the results of Step 5 over all weather stations within each Weather Zone.
7. Translate the results from Step 6 into hourly fractions.
8. For each Weather Zone and segment, compare the summed profile from Step 6 with the current profile model from Step 1, using the methods described in Appendix C, "Measuring Differences Between Load Profiles."
9. For each Weather Zone and segment, compare each weather station segment profile from Step 2 with the current profile model from Step 1, using the methods described in Appendix C, "Measuring Differences Between Load Profiles."

8.5 Non-Routine 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 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 Profile Model Change Needed

8.6.1 Possible Changes

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:

1. Adjust coefficients or change engineering estimate assumptions for one or more profile segments.
2. Re-estimate models for an adjusted static model.

3. Begin to collect new Load research data. When these data are available, use the new data to adjust coefficients or to re-estimate models for one or more Adjusted Static Models.
4. Implement changes to particular Weather Zones.
5. Implement changes to particular segments.
6. No change at this time.

Procedures for assessing the need for a change to profile segment definitions are discussed in Section 12, "Request for 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 sub-sections 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 profile models. A serious bias is a systematic difference between profiles based on the current models and 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 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 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

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.

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.

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.

The revised profile $RevProf_{szdh}$ for a particular day d for profile segment s in Weather Zone z is calculated from the Load Profile model together with the adjustment factor as

$$RevProf_{szdh} = Prof_{szdh}\ Adj_{szdh}.$$

where

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

Adj_{szdh} is the adjustment factor for profile segment s in Weather Zone z for day d at hour h.

For adjustments that are designed to address allocation across days but not across hours within days, the adjustment factor would not vary by hour h. For adjustments that are based on calendar but not weather, the adjustment factor would vary by day-type but not by individual day d.

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 sub-sections.

8.6.2.4.1 Similar Bias across Several 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

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.

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.

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 Profile Model Change

Section 8.7, Criteria for Requiring a Profile Model Change, shall be revisited and updated after the first annual evaluation of Load Profile Models by ERCOT.

As discussed in Section 8.1, Routine and Non-Routine 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.

This section details the criteria which should be applied in determining whether Load Profile changes are appropriate.

The following criteria shall be applied to determine whether Load Profile changes are appropriate based on evaluations using current Load research data:

1. 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;
2. 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;
3. 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;
4. One or more of the comparison statistics listed in Section 8.2.4.4, Summary Statistics on Differences Between Series, for a current 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;
5. One or more of the summary statistics listed in Section 8.2.4.4 for a current profile are outside the 90% confidence interval of the corresponding statistic based on the Load Profile developed from the current Load research.

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 Models

This section describes the procedures for requesting changes to Load Profile Models. Procedures for requesting changes to segments are described in Section 12, Request for 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 Who May Submit Requests for Profile Model Changes

The following entities may submit requests for Profile Model Changes:

1. Any Market Participant;
2. Any Entity that is an ERCOT Member;
3. PUCT Staff;
4. ERCOT Staff; and
5. Any other Entity that meets the following qualifications:

    (a) Entity must reside (or represent residents) in Texas or operate in the Texas electricity market, and

    (b) Entity must demonstrate that Entity (or those it represents) is affected by the Customer Registration or REC Program Sections of the ERCOT Protocols.

Requests for Profile Model changes shall be submitted to the Profiling Working Group and are subject to approval as outlined in Section 8.9.1, Timeline Prior to Implementing a Profile Change.

8.8.2 General Information Required with a Request

Requests for changes shall include the following:

- Identifying the party making the request, with contact information.
- Identifying the Load Profile segment(s) and Weather Zone(s) affected.
- If requesting a non-routine evaluation, describe why the evaluation is needed more immediately than the next routine evaluation.

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 Model Adjustment Factors

To support a request for development or revision of adjustment factors, the following types of information may be submitted:

- Analysis of data available in ERCOT systems. Such data may include recent load research data collected by 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.
- 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, Routine Evaluations.

The quality of the data should be documented as described in Section 12, Request for 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 Profile Model Changes

If the Profile Working Group (PWG) recommends a change based on the results of an evaluation, the following procedures shall be utilized to implement the change.

Recommendation by the PWG and the appropriate TAC subcommittee and approval by the TAC, of any profile model changes are required before such changes are implemented.

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 profile models. The implementation plan shall be approved by TAC.

8.9.1 Timeline Prior to Implementing a Profile Change

Refer to Protocol Section 18.2.9, 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

As discussed in Section 8.6, Assessing the Type of 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.

The calculated adjustment factors are then applied as an additional step in the calculation of the profile for that segment and Weather Zone. That is, the new or revised 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.”

For Weather Zones that do not have adjustment factors, this step may be omitted from the 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 profile methodology, the revised assumptions shall be used to determine a new engineering-based profile.

ERCOT Load Profiling Guide
Section 9: Load Profile IDs

May 1, 2007

9 Load Profile IDs

9.1 Assignment of Load Profile IDs

Transmission and/or Distribution Service Providers (TDSP) are responsible for initially assigning the Load Profile IDs of all ESI IDs, as well as, any changes in assignment. ERCOT is responsible for calculating the Load Profile Type 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

ERCOT staff is responsible for updating the Profile Decision Tree annually; these annual updates are limited to the contents of the Segment Assignment Tab and shall be submitted by the ERCOT staff to the PWG for review, to COPS for a recommendation, and to the TAC for approval. No later than five Business Days after TAC approval ERCOT shall:

(a) Issue a market notice alerting Market Participants of the change with the effective date 10 days following the issuance of the market notice; and

(b) Electronically distribute the updated Profile Decision Tree to Market Participants.

Any revisions to the Profile Decision Tree other than the annual update shall be submitted through the LPGRR process described in Section 2, Load Profiling Revision Process. ERCOT Staff may use an administrative LPGRR to revise the contents of the following Profile Decision Tree tabs:

1. Version Changes – a list of the changes in the revised version of the Profile Decision Tree;
2. FAQ – frequently asked questions related to the assignment of Profile IDs;
3. Use of Components – information about how each component of the Load Profile ID is used by ERCOT in the settlement process;
4. ZipToZone – a table that maps ZIP Codes to Weather Zones;
5. TOU Schedules – a list of the Time-Of-Use schedules and their corresponding TOU schedule codes;
6. Valid Profile IDs – a list of all Profile IDs that can be assigned to ESI IDs that are within the ERCOT region;
7. Non-ERCOT Profile IDs – a list of Profile IDs that can be assigned to ESI IDs that are within Texas, but outside of the ERCOT region; and

8. NOIEs – directions for NOIEs to use in determining 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 (SDP) are established. It is the responsibility of the TDSP to make the Load Profile ID assignment for each new ESI ID. To assign the Profile Type for new ESI IDs, the TDSP shall assign the default profile segment designated in the Profile Decision Tree on the "Profile Segments" worksheet.

9.1.3. Assignment of Load Profile IDs for New ESI IDs 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 (RMG).

[LPGRR017: Insert the following section on September 18, 2007.]

9.1.4 Assignment of BUSOGFLT Profile Type

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.

ERCOT shall review all assignments of the BUSOGFLT Profile Type on a quarterly basis, per Section 11.3.3, Validation of BUSOGFLT Profile Type.

9.1.4. 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 the Profile Decision Tree.

9.1.5. Load Profile ID Assignment for Non-ERCOT ESI IDs

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 Profile IDs, it is necessary to give them names that are different than those for ESI IDs within ERCOT.

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 the Profile Decision Tree under the "Non-ERCOT Load Profile IDs" worksheet. TDSPs shall submit for approval additional names or changes to ERCOT for their non-ERCOT Load Profile IDs. The Load Profile ID may be no more than thirty (30) characters in length. A comprehensive listing of non-ERCOT Load Profile IDs shall be maintained in the Profile Decision Tree.

9.1.6. Load Profile ID Assignment for NOIEs

Non-Opt In Entities (NOIE)s are required to submit Load Profile IDs for the ESI IDs that represent the NOIE metering points, as defined in Protocols Section 10, "Metering." The Load Profile ID shall be based on default values for four of the five fields in the Load Profile ID. The only component that shall be determined by the NOIE is the Weather Zone code. This is assigned based on the zip code at the metering point. The Profile Decision Tree contains details on Load Profile ID assignment for NOIEs.

9.2 Processes to Change Load Profile ID Assignments

ERCOT, a 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 SET transaction.

All communication among Market Participants and between Market Participants and ERCOT regarding Load Profile ID changes shall be implemented per the appropriate Texas SET transaction, except for alternative communication processes that are specified within the Load Profiling Guide (LPG).

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 TDSPs

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 Texas SET transactions.

9.2.1.1 Load Profile ID Change Related to a TDSP 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 (3) 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

This section outlines the procedures for implementing Load Profile ID changes when a meter type change occurs.

9.2.1.3.1 NIDR to IDR and IDR to NIDR

The TDSP shall install the Non-Interval Data Recorder/Interval Data Recorder (NIDR/IDR) meter in accordance with the procedures specified by the RMG and submit the Load Profile ID change to ERCOT using the appropriate Texas SET transaction with the effective date of the meter change once the meter/IDR

installation is complete. Refer to Protocols Section 18.6, “Installation and Use of Interval Data Recorders (IDR).”

9.2.1.3.2 NOTOU to TOU

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 Texas 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 regulatory approved TOU schedules specific to a TDSP service territory shall be available. These applicable TOU schedules shall be found in the Profile Decision Tree. If a Market Participant desires to use a TOU schedule that is not currently available in a specific TDSP service territory, the Market Participant shall follow the appropriate regulatory process to obtain approval of the new TOU schedule. When a new TOU schedule is approved, the TDSP shall inform ERCOT of the availability of this schedule. The new TOU schedule must be defined in the Profile Decision Tree and in the ERCOT systems. ERCOT will then notify the TDSP that it may submit the appropriate Texas SET transaction to change the affected Load Profile IDs. If more than four (4) TOU periods are requested by a CR for the approved new TOU schedule, Texas SET changes and ERCOT system changes will be required.

9.2.1.3.3 TOU to NOTOU

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

9.2.1.3.4 Business Demand to Business No Demand

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 Texas SET transactions.

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 thirty (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.

If it is determined that demand data is no longer required by either the CR or the TDSP, the TDSP has the option of:

1. Replacing the demand meter with a non-demand meter; or
2. Leaving the demand meter in place but discontinue sending any demand data for that ESI ID to ERCOT.

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.

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 Texas 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.

If the TDSP elects to replace the meter, then the TDSP shall submit the appropriate Texas SET transaction to change the Load Profile ID to ERCOT with an effective date of the meter change date.

9.2.1.3.5 No 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 the Profile Decision Tree. In the case of a Business ESI ID, the twelve (12) months used in the calculations shall be the first twelve (12) months of usage for the ESI ID. In the case of a Residential ESI ID, the first consecutive seven (7) 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 Texas SET transaction to complete the request.

ERCOT Load Profiling Guide
Section 10: kVA to kW Conversion

September 1, 2006

10 kVA to kW Conversion

At Market Opening, the majority of TDSPs meter kW demand. However, some TDSPs only meter kVA demand. To assign a Load Profile ID to an 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 of the Load Profiling Guides (LPG) addresses how kVA shall be converted to kW for Load Profile ID assignments.

This section of the LPG applies to any Market Participants such as:

1. A TDSP that currently meters kVA;
2. A TDSP that changes from kW to kVA metering; or
3. A NOIE that currently meters kVA and decides to opt-in.

The 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.

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 thirty (30) days of the submittal. Upon approval by the PWG, the request shall be sent to COPS and 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.

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.

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.

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, 2007

11 Validation of Load Profile ID

A Load Profile ID is comprised of five (5) components: Load Profile Type, Weather Zone, Meter Data Type, Weather Sensitivity, and Time-of-Use (TOU) Schedule. ERCOT shall validate the first two components, the Load Profile Type and Weather Zone, at the following times:

- As part of the initial assignment of Load Profile IDs for Opt-In Entities;
- When Load Profile segment definitions change; and
- At least one time per year during the Annual Validation process.

At the start of the validation process, the 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.

Regarding validation processes detailed in this section, electronic mail is the primary means of communication among ERCOT, 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

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 for assigning Load Profile IDs to ESI IDs.

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 the appropriate 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 SET transactions. The schedule for submitting those transactions shall be coordinated with ERCOT.

11.1.1 Validation of Initial Opt-In Entity Assignments

The Opt-In Entity shall notify ERCOT Load Profiling via electronic mail 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 (3) additional reviews to ensure all ESI IDs are set up in accordance with the appropriate Profile Decision Tree.

- ERCOT will compare each ESI ID and Load Profile ID assignment in the ERCOT database with the previously approved initial Load Profile Type;

- ERCOT will validate that Weather Zone assignment is consistent with the appropriate Load Profile Decision Tree; and

- 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.

Any discrepancies will be reported to the Opt-In Entity via electronic mail. The Opt-In Entity shall submit corrections to ERCOT via appropriate Texas SET transaction or provide details as to why the data elements have changed.

The initial Load Profile ID assignment validation is complete after all discrepancies are resolved.

11.2 Annual Validation of Load Profile Type

For the purposes of Annual Validation, ERCOT is responsible for determining the Load Profile Type assignment for all Residential and Business Load Factor ESI IDs. Transmission and or Distribution Service Provider (TDSPs) and ERCOT shall work closely and expeditiously with each other during the Annual Validation process.

When a date is listed in this Section 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 ESI IDs

The following timeline shall be adhered to, unless otherwise approved by an appropriate 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 the current Profile Decision Tree.

Residential Timeline

1. 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. 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 Profile Type assignment. An electronic copy of each list shall be delivered to each TDSP no later than June 30.
2. For each ESI ID contained in the lists, the TDSPs shall review the recommended Profile Type assignment and determine whether the recommended change is consistent with the TDSP tariffs, the applicable Retail Electric Provider (REP) billing requirements, and 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.
3. ERCOT shall send notification to CRs and the 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 Profile ID change as a result of Annual Validation.
4. The TDSPs shall coordinate with ERCOT to submit the necessary Texas SET (TX SET) transactions to update Profile ID assignments for the population of the Residential Group to be effective on the most current meter read date on or after August 15.
5. 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 Group by September 30.
6. Within the first two (2) Business Days of the TDSP successfully submitting all of its Residential transactions, ERCOT shall compare the finalized lists of recommended changes with the current Profile ID Type in the ERCOT system. ERCOT and the TDSPs will 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.

7. ERCOT and the TDSPs shall provide regular updates on the progress of Annual Validation as needed, or at a minimum during the regularly scheduled Profiling Working Group (PWG) meetings.

Business Group Timeline

1. 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. 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 Type for those ESI IDs where ERCOT recommends a change in Profile Type assignment. An electronic copy of each list shall be delivered to each TDSP no later than August 15.
2. For each ESI ID contained in the lists, the TDSPs shall review the recommended Profile Type assignment and determine whether the recommended change is consistent with the TDSP tariffs, the applicable REP billing requirements, and 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.
3. 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 Profile ID change as a result of Annual Validation.
4. The TDSPs shall coordinate with ERCOT to submit the necessary TX SET transactions to update 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.
5. 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.
6. Within the first two (2) 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

Profile ID Type in the ERCOT system. ERCOT and the TDSPs will 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.

7. 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 ESI IDs flagged for review, the issue dispute resolution process will be utilized to notify the 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 SET transaction.

11.3.1 Validation of BUSNODEM Profile Type

ERCOT shall review the most recent twelve months usage for all ESI IDs classified as Business No 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.

[LPGRR017: Insert the following section on September 18, 2007.]

11.3.3 Validation of BUSOGFLT Profile Type

ERCOT shall verify that only eligible ESI IDs are assigned the 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.

11.3.3 Validation of NMFLAT and NMLIGHT Profile Types

ERCOT shall review all ESI IDs and their usage which are classified with either an NMFLAT or 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.

11.3.4 Comparison of ESI ID Profile Type to ESI ID 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.

11.3.5 Validation of Service Address Zip Code

ERCOT shall validate that the service address 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.

11.3.6 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 utilizing the service address zip code in ERCOT's system. Any discrepancies shall be reported to the TDSP.

11.3.7 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.

11.3.8 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 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 Protocols Section 11.4.3.1 "Weather Responsiveness Determination".

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

January 1, 2007

12 Request for Profile Segment Changes, Additions, or Removals

This section of the LPG addresses changes, additions, and deletions to profile segments, with the exception of profile segment modifications addressed in Section 16, “Supplemental Load Profiling.”

The steps and tests identified to introduce new profiles or changes to profiles are intended to fulfill the criteria established in Protocols Section 18.2.1, “Guidelines for Development of Load Profiles.” With market experience and an increase in the availability of Load Research data, the PWG expects the accuracy and precision of the profiles to improve. Threshold values in establishing criteria for profile changes shall be determined with market experience. Furthermore, no modifications shall be implemented until at least one (1) year after the start of the retail pilot.

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.

1. Creation of a new profile segment from one or more existing profile segments.
2. Redefinition of existing profile segments.
3. Removal of existing profile segments.

12.1.1 Creation of a New Profile

When a new profile segment is created, there may be an impact to one or more existing profiles segments. This new segment will be applied to ESI IDs that are removed from:

- a single existing profile segment, or
- multiple existing profile segments.

If a new profile segment is created, adjustments may be required to the affected existing profile segment(s).

12.1.2 Redefinition of Existing Profiles

Redefinition of existing 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 profile segments.

12.1.3 Removal of Existing Profiles

A request to remove an existing profile segment shall provide information similar to that required for the creation or change of a segment. Supporting documentation shall provide evidence that the profile proposed for removal does not satisfy the standards for a separate profile. Specifically, the group represented by the profile may be as follows:

- Too small to justify a separate profile segment, as described in Section 12.5, “Groups of ESI IDs Eligible to Become Profile Segments,” and/or
- Sufficiently similar to one or more existing profiles, according to the measures defined in Section 12.5, “Groups of ESI IDs Eligible to Become Profile Segments.”

Removal of an existing profile segment necessarily means changing definitions of one or more existing profile segments to include the ESI IDs currently in the proposed removed segment. Accordingly, a request to remove a profile segment shall typically require supporting documentation for changing the definition of an existing segment.

12.2 Who May Submit a Request

Any Market Participant, ERCOT, or the Profiling Working Group (PWG) may submit a request for a change to profiling segments according to the procedures outlined in this section.

12.3 Procedure for Submitting a Request

ERCOT shall post a profile segment change request form to the ERCOT public website. A completed application form shall accompany all requests for a profile segment change. Data sets, supporting files, and documentation shall be provided in electronic form.

If the originator of the 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 PWG.

12.4 Process Timing for Requesting Changes

Requests for changes may be submitted to ERCOT staff at any time. Within two (2) business days of receiving the request, ERCOT staff shall reply to the submitter indicating that the request has been received.

As required by Protocols Section 18.2.9, "Adjustments and Changes to Load Profile Development," ERCOT staff shall respond to the request within sixty (60) days. This period does not include the time required to analyze and render the final decision of the request. The response shall indicate:

- That the request is complete;
- The date by which a recommendation on the request is expected to be ready and available to the requestor;
- The date by which the recommendation is expected to be presented to PWG.
- The best guess time the requested change is expected to be implemented (ready for settlement), if approved.

During ERCOT's evaluation of the request, ERCOT may request supplemental information determined to be important to justifying the new segment.

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.

A requestor may, at their discretion, submit a profile segment change request with supporting information and documentation, which includes all the criteria listed in these Guides 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.

Upon completion of the review outlined in these Guides in Section 12.8, "Evaluation of the Request," ERCOT staff shall make a recommendation to the PWG regarding conditional approval. If the recommendation is to grant conditional approval, then ERCOT staff 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.

No changes shall be implemented until at least one (1) year after the start of the retail pilot. After that time, approved changes shall be implemented on a semi-

annual basis. That is, rather than implementing a series of separate changes over a period of weeks or months, the collection of all changes approved since the last semi-annual change (or in the case of the first semi-annual change, since Market Open) shall be implemented at the same time twice a year.

According to Protocols Section 18.2.9, "Adjustments and Changes to Load Profile Development," ERCOT shall provide appropriate notice to all Market Participants prior to implementation of any change. Load Profile ID changes to each ESI ID shall be made in accordance with Section 9.2, "Processes to Change Load Profile ID Assignments."

An exception to the practice of implementing profile segment changes semi-annually shall be made when special circumstances warrant a more immediate change to correct a market problem. Such changes, at a minimum, require the approval of the Technical Advisory Committee (TAC).

12.5 Groups of ESI IDs Eligible to Become Profile Segments

For a group of ESI IDs to be a distinct profile segment, the group shall satisfy the following requirements:

1. The group is based on readily identifiable parameters, which are not subject to frequent change.
2. The group is reasonably homogeneous as defined in Section 12.6.4, "Homogeneity."
3. The group is sufficiently different from other existing profiles as defined in Section 12.6.2, "Difference from Current Profiles."
4. The group is of sufficient size to justify its own profile segment as defined in Section 12.6.3, "Size."

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 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. A 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 Protocols Section 18.6.1, "Interval Data Recorder (IDR) Installation and Use in Settlement."

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 (9)

guidelines in the Protocols, Section 18.2.1, “Guidelines for Development of Load Profiles.”

12.5.1 Universal Profile Segment Applicability

As a general rule, a profile segment definition shall be universally applicable. Universally applicable means:

1. The profile may be applicable to all Competitive Retailers (CRs),
2. Once defined, the profile shall be applied to any ESI ID that meets the eligibility criteria,
3. The profile shall be public, and
4. The decision to add the profile shall not be solely on the private interests of the requestor.

There are limited exceptions as described in Section 16, “Supplemental Load Profiling.”

12.5.2 List-Based Segments

An additional exception to the requirement of universal applicability is a list-based profile segment. A list-based 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.

The profile shall satisfy the requirements 3 and 4 of Section 12.5.1, “Universal Profile Segment Applicability,” A list-based segment also shall satisfy requirements 1 through 4 listed in Section 12.5, “Groups of ESI IDs Eligible to Become Profile Segments.” ERCOT shall perform all validation, audit checks and normal managing of profile segments as currently defined.

If additional data are needed in ERCOT systems to implement the list-based 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:

- Unambiguous Group Identification
- Difference from Current Profile Segments
- Size

- Homogeneity
- Quality Assurance Methodology for ESI ID Identification

12.6.1 Unambiguous Group Identification

The definition of the group shall be provided in the request for the new profile segment. The request shall unambiguously define specific criteria for an ESI ID to be included in the new profile segment. In a request to change an existing 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

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.

Examples of information available in or derived from the ERCOT data systems include, but are not limited to:

- Monthly or annual kWh consumption
- Metered monthly or annual peak demand for demand-metered customers
- Monthly or annual load factor
- Ratio of seasonal consumption values
- Zip code

12.6.1.2 Identification Based on Other Means

Segments based on other criteria may be requested. ERCOT, in coordination with the 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 Profile Segments

A list-based profile segment is defined by specifying a list of ESI IDs to be included in the 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.

The submitter also shall adhere to the requirements of Section 12.6.5, "Quality Assurance Methodology for ESI ID Identification."

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:

- Demonstrating that the population so defined is not subject to frequent change;
- Preventing an ESI ID from appearing on multiple lists;
- Limiting opportunities for unsubstantiated or inappropriate profile assignments;
- Merging lists for list-based segments.

12.6.2 Difference from Current Profile Segments

A requested new profile segment shall be shown in the supporting documentation to be different from existing profiles in ways that improve the accuracy of settlement.

In a request to change existing 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.

If documentation demonstrates that the ESI IDs in the requested profile segment are different from the profile segment that they are currently assigned and more similar to another existing profile segment, then the resolution of the request may be to reassign these ESI IDs to the most similar existing profile segment.

Requests to create new 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 profile segments. All differences between 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

As supporting documentation of difference from existing profiles, the strongest evidence would be a statistically valid load research sample from the proposed segment population, which may be compared with the assigned 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.

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.

Examples of less compelling, but supportive documentation would be other types of load research data, such as:

- Data from ad hoc or convenience samples
- Data from a similar population from another area.

When less compelling data is submitted, the submitter should also submit evidence to support the applicability of the data to the proposed 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:

1. Documentation of operating schedules for the proposed group and comparison with typical schedules for premises in the currently assigned profile.
2. End-use saturation data, comparing the proportions of premises with particular types of electric end uses for the proposed group and currently assigned profiles. Such data shall be relevant to the proposed population in ERCOT.
3. 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

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:

- Summary statistics on differences of series
- Load-weighted average price
- On/Off peak ratio
- Load Factor
- Deadweight Loss

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.

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, "Measuring Differences Between Load Profiles," 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 Profile Comparisons

Comparisons between profiles for proposed segments and existing 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:

1. The comparison between the proposed segment and the existing profile is made separately for each Weather Zone.
2. A single profile representing the proposed segment as a whole is compared with a single composite profile for the existing segment.

These methods are not required for profiles that are the same across all Weather Zones.

12.6.2.4 Comparison Separately for Each Weather Zone

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. Comparison separately 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 profiles for the proposed weather segments.

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

If a single profile is estimated for the proposed segment as a whole across several Weather Zones, this profile may be compared with a composite of existing 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.

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.”

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 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 profile. The comparison

composite existing profile shall then be calculated using the energy amounts that correspond to the profile requested.

12.6.2.6 Summary Statistics on Differences of Series

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 include:

- Unitized load,
- Monthly fractions,
- Daily fractions, and
- Clock-hour fractions.

Each of these series may be calculated for a profile representing the proposed segment and for the existing profile or profile that would otherwise be assigned.

The difference between the series for the proposed and existing profiles is then measured in terms of one of the following summary statistics:

- Mean difference,
- Mean absolute percent error,
- Mean absolute deviation, and
- Root mean square error.

12.6.2.7 Load-Weighted Average Price

Load-weighted average annual price is calculated using a profile representing the proposed segment, and using the profile for the currently assigned or existing segment. The difference in load-weighted annual price between these two 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 profile representing the proposed segment and for the existing 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 profile for the proposed segment and for the existing profile. The load factor for the existing 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 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 profiles for each of several sub-segments rather than representing all of them by a common profile. An equation is also provided for the deadweight loss reduction from segment changes that are not simple subdivisions.

12.6.3 Size

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.

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.

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 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

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."

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:

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

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
Upop = load-weighted average price calculated using the (estimated) population load shape.

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.

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.

As for demonstration of differences from existing profiles, lesser evidence may be provided based on analysis of load data from case studies, samples of convenience, or 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:

- Survey data or other evidence of appliance or equipment present in the premises
- Data on operating schedules
- 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 ESI ID Identification

If the procedure for identifying ESI IDs applicable to the new 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 profile segment and that they are removed from the profile segment when appropriate.

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.

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.

Adequacy of the quality assurance methodology shall be a primary consideration in deciding whether to approve or disapprove the Profile Segment Change Request.

12.7 Costs for Profile Segment Changes

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 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 profile segment change.

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 TDSP.

If a profile segment change request receives final approval under the provisions of these Guides, and results in the adoption of a new profile segment available to all CRs, the provisions of Protocols Section 9.9, "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 profile segment. Once a profile segment change request receives final approval, any subsequent costs required for ongoing support of the profile segment shall be considered part of the usual operation and maintenance expense for profile segments available for use by all CRs.

After the first year of full market operation, ERCOT shall provide cost and feasibility analysis to the market for creating new profile segments. After the cost and feasibility analyses are completed by ERCOT, the PWG shall evaluate whether to allow requester-sponsored profile segments that are not universally applicable and are not specifically associated with supplemental profiling. If such requester-sponsored segments are allowed, the requesting party may be required to pay the costs incurred by ERCOT to implement this new profile segment that is not universally applicable as defined above.

12.8 Evaluation of the Request

ERCOT staff 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 Protocols Section 18.2.1, "Guidelines for Development of Load Profiles."

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 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 staff shall make a recommendation to the PWG and the requestor regarding additional load research sampling needed to support the request. ERCOT staff 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.

Factors considered in assessing requests shall include, if applicable:

- The quality of the supporting data provided;

- The magnitude of differences indicated;
- The size of the affected population;
- The homogeneity of the population;
- The reliability of the estimates of differences, size, and homogeneity;
- The impact on the settlement cost allocations;
- The affect on the rest of the market if the change is accepted;
- The feasibility and reliability of the population identification method;
- The potential for customer migration in and out of the proposed segment;
- The feasibility and reliability of the quality assurance methodology for ESI ID identification.

12.9 Resolution of the Request

12.9.1 ERCOT Staff Initial Recommendation

ERCOT staff shall provide a written report detailing their evaluation of the Profile Segment Change Request to the submitter on or before the date specified in Section 12.4, "Process Timing for Requesting Changes." If ERCOT staff 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

Upon receipt of the written report, the submitter shall have up to thirty days to make comments and recommendations to ERCOT staff. Upon receiving the submitter's comments, ERCOT staff shall then have up to thirty days to reconsider and, if appropriate, revise their recommendation and provide a revised written report to the submitter.

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 PWG

When ERCOT staff 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 Chair of the PWG, who shall schedule time on the PWG agenda at the next available opportunity for the submitter and ERCOT staff to formally present the request and recommendations.

ERCOT staff may also recommend other actions, such as a modified definition of the proposed segment or other affected profile segments. ERCOT staff's

evaluation of a change request may be conducted in conjunction with analysis of other requests and/or with the general semi-annual evaluation specified in Section 12.4, "Process Timing for Requesting Changes." Recommendations may be made jointly for more than one affected request and existing profile segments.

ERCOT staff shall also recommend to the PWG whether the requested 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 staff's judgment regarding the appropriateness of either methodology.

If a request has been granted conditional approval, following the completion of the load research sampling and analysis, ERCOT staff shall also reconsider the recommendation regarding settlement methodology for the new profile segment made at the time the conditional approval was granted. If, based on the reconsideration ERCOT staff 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 PWG Disposition of Request

Following the presentation referenced in Section 12.9.3, "Presentation to PWG," the PWG shall prepare a recommendation on the action that should be taken with respect to the request. Possible recommended actions include:

- No change to existing profile segments;
- Conditional approval of a new profile segment for a requested group;
- Creation of a new profile for a requested group, with no changes to other existing profile segments;
- Creation of a new profile for a requested group, with adjustments made to one or more other affected profile segments;
- Redefinition of an existing profile to include the requested group, with no change to the existing profile segment or to any other profile segment;
- Redefinition of an existing profile segment to include the requested group, with adjustments made to one or more affected profile segments.

If the request is granted conditional approval and the requestor agrees, ERCOT staff 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 staff,

the criteria are met, the request shall be granted final approval; if the criteria are not met the request shall be denied.

Creation of a new profile segment or redefinition of an existing profile segment to include a requested group may require modification of existing affected profile segments. Whether or not an adjustment to existing profile segment is recommended shall depend on the magnitude of the difference in the existing profile segment implied by removal or addition of the segment, as well as the cumulative effects of multiple such removals and additions.

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 Technical Advisory Committee (TAC) for further disposition.

If the PWG is considering a recommendation from ERCOT staff to change the profiling methodology to be applied to a conditionally approved new profile segment, the PWG shall make a recommendation to the 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 profile segment change request.

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

September 1, 2006

13 Changes to Weather Zone Definitions

Changes to Weather Zones and any combination thereof that may be requested include:

- Changes in Weather Zone boundary definitions;
- Changes in the boundaries of weather modeling regions;
- Changes in the weather stations used;
- Changes in the weighting of weather stations used within a Weather Zone.

Any change to Load Profile ID assignments resulting from an approved modification to the definitions of Weather Zones shall not be retroactively applied.

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 ESI IDs located within the geographic boundaries of the Weather Zone. Zip codes are mapped to Weather Zones and are defined by the Zip-to-Zone mapping in the Profile Decision Tree.

13.1.3 Costs

Responsibility for costs related to a requested Weather Zone change are the same as for a requested segment change as described in Section 12.7, "Costs for Profile Segment Changes."

13.2 Changes to Weather Zone Boundaries

13.2.1 Types of Weather Zone Boundary Changes

Changes to Weather Zone boundaries and any combination thereof, may occur due to the following conditions:

- Subdivision: An existing Weather Zone is divided into two or more zones.
- Boundary shifting: Existing Weather Zone boundaries are moved so that areas are shifted between Weather Zones.
- Boundary collapsing: Existing Weather Zone boundaries are moved so that one Weather Zone is created from two or more existing Weather Zones.

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."

At Market Open, there are four (4) distinct zone constants that use weather data from eight (8) Weather Zones in the model. The table below indicates the Weather Zone groupings into weather modeling regions with a common set of zone constants.

Table 1
Weather Zones Assigned to Weather Modeling Regions as of January 1, 2002

Weather Zones	Weather Modeling Regions (Zone Constants)
NCENT	NCENT
EAST	NCENT
NORTH	NCENT
FWEST	WEST
WEST	WEST
SOUTH	COAST
COAST	COAST
SCENT	SCENT

Boundary shift considerations:

- A shift *within* a modeling region is a boundary shift where all zones affected by the shift have the same zone constants.
- A shift *across* modeling regions is a boundary shift where zone constants are different between areas affected by the shift.

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, 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

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.

The change request shall propose the weights to be used for the weather stations in each Weather Zone to be created or changed. At Market Open, 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 market settlement.

13.2.3.1 Calculated Load Profiles

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.

- For a subdivision or a shift within a weather-modeling region, Load Profiles shall be calculated using the existing zone constants.

  - 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.
  - 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.
- For a shift across modeling regions, the following calculated Load Profiles shall be provided for each shifted area:
  - Load Profiles calculated using the zone constants of the currently assigned zone:
    - Using the weighted average for the current Weather Zone;
    - Using the weighted average weather of the current zone after the shifted area is removed, with the proposed weights;
    - Using the weather of the shifted area only.
  - Load Profiles calculated using the zone constants of the receiving zone, to which the shifted area is proposed to be moved:
    - Using the weighted average for the receiving Weather Zone;
    - Using the weighted average weather of the receiving zone after the shifted area is added, with the proposed weights;
    - Using the weather of the shifted area only.

The profile using the weather for the shifted area and its current assigned zone constants shall be different from the other two profiles calculated with the current zone constants for the area. The 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 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

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:

- Load research data from the affected area, from the current Weather Zone excluding the affected area, and from the proposed receiving Weather Zone;
- Equipment operating data from each area;
- End-use equipment saturation data from each area;
- Monthly consumption patterns from each area.

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 profiles based on the proposed versus current Weather Zones shall be assessed similarly to an assessment of a new versus existing segment, by consideration of the same types of factors as described under Section 12.6.2, "Difference from Current Profiles." Only those Load Profiling 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

Any requested change to weather modeling regions shall be treated as a special case of a request for a change in 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.

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, described in Section 12, "Requests for 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:

- The quality of the supporting data provided;
- The magnitude of differences indicated;
- The size of the affected populations;
- The complexity of the change required;
- The effect on other Weather Zone(s) and other weather modeling regions if the change is accepted;
- The effect on ERCOT systems;
- The enhancement of settlement accuracy.

13.4 Changing Weather Stations

13.4.1 Requests for Changes

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.

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 Model 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 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 NOAA Weather Station

Weather station changes shall be necessary in the event that a station currently used is discontinued by 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 Zip Codes

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 ESI IDs shall continue to be correctly assigned.

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

September 1, 2006

14 Load Profile ID Dispute Procedure

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

14.1 Who May File 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 assignment, 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

TDSPs and ERCOT share responsibility for the assignment of Load Profile IDs. CRs may request a Load Profile ID assignment change as a dispute of an existing Load Profile ID assignment. Requested changes to remove an ESI ID from a default Load Profile ID should only be made after adequate monthly data becomes available.

14.2.1 Disputes Involving ERCOT

Disputes involving ERCOT should be submitted using ERCOT retail transaction issue resolution system for any of the following cases:

- Requests to remove an ESI ID from a default Load Profile ID. Such requests should only be made after adequate monthly data becomes available;
- Disputes regarding ERCOT calculations made as a part of Annual Validation; and
- Disputes regarding ERCOT calculations relating to the Weather Sensitivity code.

ERCOT is responsible for all disputes defined in this section for all Profile Decision Tree versions and all Annual Validation years.

14.2.2 Disputes Involving TDSPs

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 Protocols Section 20, “Alternative Dispute Resolutions Procedures.”

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 TDSP issuing the appropriate Texas SET transaction.

ERCOT Load Profiling Guide
Section 15: Load Research Samples

September 1, 2006

15 Load Research Samples

Load research samples are required by ERCOT as the basis for developing and evaluating Load Profiles for most Load Profile Types. Protocols Section 18.2.11, "Responsibilities of Sampling in Support of Load Profiling," broadly define the responsibilities of ERCOT and TDSPs regarding load research samples. This part of the Load Profiling Guides (LPG) also provides guidelines on communication and expectations between ERCOT and TDSPs in fulfilling those responsibilities.

TDSPs have provided their load research data in the past and shall continue to provide available data in the future in the interests 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 Protocols 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.

TDSPs and NOIEs provided all load research data to ERCOT used in the initial development of Load Profiles. ERCOT shall periodically request current load research data from all TDSPs and NOIEs for Load Profile model evaluations. ERCOT plans to develop and arrange for implementation of its own load research samples.

Language in the LPG may change per The PUCT Rulemaking Project 25516 "Rulemaking to Load Profiling and Load Research".

15.1 TDSP Samples

15.1.1 Maintenance of existing samples

TDSPs, with current load research samples, are required by Protocols 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:

- Replacing sample points as needed to compensate for sample attrition,
- Replacing or repairing malfunctioning data collection equipment as needed,
- Maintaining and operating data collection and processing systems, and
- Providing annual reports to ERCOT as defined in Section 15.1.2, "Notification to ERCOT."

Subject to the one (1) year notification requirement in Section 15.1.2, "Notification to ERCOT," 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

For any major change to the design of a sample, the TDSP shall provide ERCOT with at least one (1) year advance notice. In particular, this amount of advance notice shall be given for taking an existing sample out of the field.

TDSPs shall also provide one (1) year advance notice, whenever practical, for any of the following changes:

- Putting a new sample into the field.
- Rotating a sample, by systematically replacing a subset of the current sample with new sample points.
- Adding supplemental strata to account for new accounts added to the population of the class.
- Bulk replacement of equipment or data collection systems with new types of equipment or systems.
- Other major changes to the Sample Design or implementation.

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 (1) year notice to ERCOT.

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

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.

TDSPs shall update ERCOT with a report by September 1st of each year regarding any major changes to samples planned for the next twelve (12) months.

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., PUCT mandate). TDSPs shall provide requested data to ERCOT within sixty (60) days.

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.

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 (or for the first such report, as of the time data were delivered to ERCOT for development of the profiles for Market Open), 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 6 under the following section.

15.1.2.3 Required Information

The following information is required as part of the annual reporting and data transmittal.

1. Included as fields in the data files provided:
   - Data quality flags,
   - Sample expansion weights, and
   - Stratum identifiers.
2. A data dictionary providing the file layout(s) and codebook.
3. For each class sample, a description of the Sample Design, stratification, procedure for calculating expansion weights, and data validation procedures.
4. For each stratum in each sample:
   - The original and current sample sizes
   - The original population number of customers and annual energy in MWh
5. For each class sample, the most recent available estimates of annual peak load and whatever accuracy measures have been calculated for that estimate.

- The date for which the analysis was conducted and the year when the analysis was completed shall also be reported.
- 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.

6. Plans for any major changes, as defined in Section 15.1.2, "Notification to ERCOT," planned for the next twelve (12) months.
   - The type of change planned
   - The anticipated schedule
7. Description of major changes during the preceding twelve (12) months. Major changes include the bulleted items under Section 15.1.2, "Notification to ERCOT." For each change, the TDSP shall indicate:
   - The type of changes made
   - The timing of the changes.

Items 1 through 5 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 6 and 7 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

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.

1. For each stratum in the sample
   - The number of points removed and added in the past year, excluding direct replacements
   - The fraction of intervals with missing or bad data
2. For each class sample
   - Distributions of energy
   - Definitions of rate classes (TDSP tariffs) that the samples are applicable to, along with the rate classes that the samples are assigned to
3. Description of sample coverage
   - Give customer counts and annual energy for the portion of the population that is not represented by any of the samples.

- 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.
- Provide this information separately by residential and business categories

ERCOT shall provide a standard reporting format for TDSPs' 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 TDSP Samples

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.

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 above in Section 15.1.2, "Notification to ERCOT." Information the TDSP shall provide about a planned new sample shall include:

- A description of the population to be represented by the sample
- The relationship between this population and classes represented by current samples or previously existing samples for which data have been provided to ERCOT
- The approximate size of the population, in number of customers and MWh.

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:

- The Sample Design accuracy target
- The estimation method for which the sample accuracy is designed (typically, mean-per-unit or ratio estimation)
- The stratification scheme
- The population size of each Sampling cell, in number of customers and annual MWh
- The sample size of each Sampling cell.

15.2 ERCOT Samples

According to the Protocols Section 18.2.11, "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:

- Replace sample points as needed to compensate for sample attrition.
- Replace or repair malfunctioning data collection equipment as needed.
- Review incoming data on at least a monthly basis to identify problems of high rates of missing data, or anomalous values.
- Repair or correct apparent equipment or system malfunctions on a timely basis.
- 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

(Revisit after PUCT ruling in Project No. 25516)

Load research data collected by ERCOT shall be available only to ERCOT or its designated agent. 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 Protocols Section 18.3.1, "Methodology Information." This data is strictly used for Load Profiling purposes.

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:

- ERCOT's estimate of average kW per ESI ID in each time interval based on the load research sample,
- Standard errors or other statistical accuracy measures for the estimated average kW per ESI ID in each interval, and
- Sample size.

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

Load research samples developed by ERCOT shall be designed to meet a standard of ± 10% accuracy at 90% confidence. A discussion of the meaning of accuracy measures and procedures is in the *AEIC Load Research Manual.*

For load research samples used for universally applicable profiles, this accuracy standard shall be applied at the level of each profile segment definition. It is preferred that this accuracy standard should be achieved at the level of a distinct Profile Segment and weather modeling region. Universally applicable profiles are defined in Section 12, "Requests for Profile Segment Changes, Additions, or Removals." Weather modeling region is defined in Section 13, "Changes to Weather Zone Definitions."

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.

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.

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:

1. Accuracy of the fraction of energy allocated into each of several Time-of-Use periods (several being about four (4) time periods).
2. Accuracy of the ratio of on-peak to off-peak consumption.
3. Demand at the peak hour in each month.
4. Total energy consumption in each month.
5. Accuracy of load-weighted average price, using a standard price series.

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

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.

(Revisit after PUCT ruling in Project No. 25516)

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.

Information that ERCOT shall provide to the PWG about a planned new sample shall include:

- A description of the population to be represented by the sample.
- The relationship between this population and classes represented by current samples or previously existing samples for which data have been provided to ERCOT.
- The approximate size of the population, in number of customers and MWh.

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:

- The Sample Design accuracy target.
- The estimation method for which the sample accuracy is designed (typically, mean-per-unit or ratio estimation).
- The stratification scheme.

- The population size of each Sampling cell, in number of customers and annual MWh.
- 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:

1. Indications that existing models do not perform well in areas that do not have recent load research data. Such indications could include:
   - Load Profiles whose monthly fractions are very different from those observed in monthly billing data for a particular area
   - Systematically high Unaccounted for Energy (UFE) for a particular area
   - Other indicators that the equipment present or operating patterns are very different in a particular area from that for load research data were available.
2. Reported plans by a TDSP to discontinue collecting load research data for particular samples.
3. Determination that too much time has elapsed since the load research data on which current models are based were collected.
4. 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

September 1, 2006

16 Supplemental Load Profiling

Protocols Section 18.7, "Supplemental Load Profiling," requires that supplemental Load Profiles be developed for programs or pricing schemes that encourage a demand response to price in the retail market. A demand response 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 Guides (LPG) are intended only for demand response programs or pricing schemes. Use of these methodologies for other applications requires approval of the ERCOT Board.

The Protocols allow premises with TOU meters to be settled by a profiling method known as chunking, which is described below in Section 16.1.3, "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 (Protocols Section 18.7.2, "Load Profiling of ESI IDs Under Direct Load Control"). Other supplemental profiles (Protocols Section 18.7.3, "Other Load Profiling") are limited to segments that are subject to pricing schemes designed to encourage demand response. The appropriate methodology for other supplemental profiling shall be determined based on the characteristics of the demand response program.

16.1 Load Profiling for Time-of-Use Schedules

Subject to the following restrictions (Protocols Section 18.7.1, "Load Profiling of Time-of-Use Metered ESI ID") all Competitive Retailers (CRs) have the right to offer Time-of-Use (TOU) schedules in all TDSP service territories:

1. Within each TDSP service territory, a CR may offer only those schedules that either:
   a. were in effect in that service territory for an existing TOU TDSP tariff prior to December 31, 2000; or
   b. are agreed to by the TDSP.
2. Implementation of any new TOU schedule is subject to the ERCOT and Texas SET change control process.
3. Within an Investor-owned TDSP service territory, only TOU schedules approved by the PUCT for use in that territory may be used.

The right to use TOU schedules, subject to restrictions 1 and 2, applies in both investor-owned TDSP service territories and in other territories if Non-Opt In Entities (NOIEs) opt in. For purposes of TOU Schedule management, all TOU

Schedules for other territories that opt into the market shall be considered new TOU Schedules and therefore subject to the new TOU Schedule process in Section 16.1.2, "Establishing New TOU Schedules."

16.1.1 Existing TOU Schedules

Any TOU schedule currently approved by the PUCT within an investor-owned TDSP service area may be used. Currently approved and supported TOU schedules are published on the Profile Decision Tree.

16.1.2 Establishing New TOU Schedules

For use within an investor-owned TDSP service territory, any new TOU schedule requires PUCT approval. Such approval is not required for new TOU schedules in other service territories not regulated by the PUCT. For new TOU schedules in service territories not regulated by the PUCT, approval from the governing regulatory body is required prior to implementation into the competitive market. Any requested TOU schedule failing to have appropriate regulatory approval shall not be implemented by ERCOT. *(Revisit opt-in entities' TOU schedules.)*

All TOU schedules in the ERCOT system shall be identified and coded into the ERCOT data processing system. A Market Participant requesting the use of a new TOU schedule shall submit the approved TOU schedule to ERCOT. ERCOT shall code its data processing system to accommodate the new TOU schedule. When coding is completed ERCOT shall provide the requester with the ERCOT Time-of-Use Schedule Code, which identifies the new TOU schedule.

At Market Open, the ERCOT data processing system can only accommodate TOU schedules that have no more than four (4) Time-of-Use periods (e.g., Off-Peak, Mid-Peak, On-Peak, Super-Peak). If the requested schedule has more than four (4) Time-of-Use periods then ERCOT shall perform programming to accommodate the new TOU schedule. ***Any decision to accommodate more than four (4) TOU periods is subject to assessment of system change requirements by ERCOT, in accordance with ERCOT and Texas SET change control processes.*** With approval, ERCOT shall modify its data processing system to handle TOU schedules having more than four (4) TOU periods. After the data processing system has been modified to handle TOU schedules with more than four (4) TOU periods, the requested TOU schedule shall be implemented.

16.1.2.1 Timing of New TOU Schedule Implementation

Once approved and ERCOT is notified, a new schedule with up to four (4) TOU periods shall be implemented by ERCOT within seven (7) business days, subject to the phasing in by billing cycle indicated in Protocols Section 18.2.9, "Adjustments and Changes to Load Profile Development."

If a schedule with more than four (4) TOU periods is approved, the time to implement this schedule shall include the amount of time to modify the ERCOT data processing systems. Implementation time may be greater than seven (7) business days, as required to accomplish all the necessary system changes.

When any new TOU schedule has been implemented and a TOU meter has been installed and programmed to record kWh per the TOU schedule, any CR may begin submitting ESI IDs with a Load Profile ID reflecting this TOU schedule for the approved TDSP service area to ERCOT.

16.1.3 Chunking Profiling Methodology Description

The chunking method of Load Profiling for TOU customers means that a standard 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 Time-of-Use (TOU) period is allocated to time intervals within the TOU period in proportion to the Load Profile level at each interval in that period.

16.1.4 Evaluation of the Chunking Profiles

The standard 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 Profile Models without Current Load Research Data." If load research data are available for a sample of TOU customers, these data could also be used in the evaluation using methods discussed in Section 8.3, "Evaluating Profile Models without Current Load Research Data."

Additional procedures that may be used to assess the adequacy of chunking include the following:

1. Assess chunking as a general method based on profiles from other areas.
2. Assess chunking using load research data collected in the ERCOT service territory.
3. Assess chunking using data on customer characteristics in the ERCOT service territory.

These procedures are described below.

16.1.4.1 Assessment of Chunking as a General Method Based on Profiles from Other Areas

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 profiles based on separate load research samples for a TOU class and a corresponding NOTOU class.

The assessment compares the source service area's TOU profile based on the TOU sample to a chunked profile created by applying the chunking method to the source service area's corresponding NOTOU profile. To create the chunked profile, the TOU schedules applicable from this TOU class in the source service area are used, with the chunking procedures described in Section 16.1.3, "Chunking Profiling Methodology Description."

The two profiles are compared using the comparison methods of Section 8, "Load Profile Models." In the terminology of that section, the first profile, based on the actual load research data from the TOU class, is treated as the proposed profile. The second, chunked profile is the existing profile. That is, the second profile is the profile the existing ERCOT methodology would use for the TOU class, if these classes were in ERCOT.

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 profiles for many of the classes studied would indicate problems with the general approach. Substantial similarities between the two profiles for most classes would indicate that the general method is reasonable.

16.1.4.2 Assessment of the Chunking Method Using ERCOT Load Research Data

This assessment relies on a limited ERCOT load research sample to evaluate the TOU profiles developed by chunking. The goal is to compare two profiles:

1. The existing chunked TOU profile developed by applying the chunking method to a NOTOU profile.
2. A profile for the same population of TOU ESI IDs developed from a direct load research sample of that population.

This comparison is made for several different ERCOT TOU profiles.

For purposes of this assessment, ERCOT may implement a limited load research sample from each ERCOT TOU schedule and segment to be studied. The

Sampling criteria for each profile segment 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.

For each segment and TOU schedule 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 profile, using the comparison methods of Section 8, “Load Profile Models.” In the terminology of that section, the chunked profile is the existing profile, and the profile developed from the load research sample is the proposed profile.

Substantial differences between the two profiles for many of the classes studied would indicate problems with the general approach. Substantial similarities between the two 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.

16.1.4.3 Assessment of Chunking Method Based on Characteristics of the TOU and NOTOU Populations

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 NOTOU profile.

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.

If substantial differences are found, ERCOT may develop rough adjustments to the NOTOU 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.

The adjusted profile would then be chunked to provide a new estimate of the TOU profile. This new TOU profile would then be compared with the original TOU profile, using the comparison methods of Section 8, “Load Profile Models.”

In the terminology of that section, the original chunked profile is the existing profile, and the new profile developed from chunking the adjusted NOTOU profile is the proposed profile. However, this new profile based on rough adjustments would not in fact replace the existing TOU profile if substantial differences are

found. Rather, these differences would be taken as an indication that the chunking method is inadequate for this segment.

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.

16.1.5 Revisions to TOU Profile Methods if Changes Are Needed

If the current chunking is determined to be an inadequate methodology for profiling TOU customers, the change to any other profiling method for these customers would require ERCOT Board approval in accordance with the Protocols Section 18.2, "Methodology." The primary alternative that would be considered is lagged dynamic Load Profiling. Other alternatives may be proposed.

16.2 Direct Load Control (DLC)

16.2.1 General Procedure

According to the Protocols Section 18.7.2, "Load Profiling of ESI IDs Under Direct Load Control," DLC programs involve CRs managing their demand response program effectively. These programs require a "statistically representative load research sample on the DLC population" as a profile.

All such profiles shall be implemented as lagged dynamic profiles. For all settlements, the DLC population load shape shall be estimated using either the load research data collected for the settlement day, load research data collected for a proxy day or standard profiles for the settlement day. The rules for deciding which data to use for settlement are outlined in Section 16.2.8, "Processing Load Research Data." If the program operator arranges for daily collection of interval data from the metering sample used to generate the Representative Interval Data Recorder (RIDR), then ERCOT shall use this RIDR as appropriate for settlements. Data quality requirements are discussed in Section 16.2.9, "DLC Program Settlement and BUL Baseline Calculation Methodology."

16.2.2 Requirements for Load Profiles for DLC

A distinct RIDR with separate load research samples is required for each separately operated DLC program. CRs with ESI IDs participating on a jointly dispatched DLC program shall be settled on the same RIDR, regardless of which CR serves the ESI ID. A CR must obtain ERCOT approval to participate in a jointly dispatched DLC program. ERCOT shall act on request for approval in a prompt and reasonable manner.

If groups of DLC premises are separately dispatched, the CR must register the separately dispatched groups as distinct DLC programs, and a separate load research sample shall be required for each program. If a CR wishes to bid load reductions for the DLC program into the BUL market, and if the program has DLC premises in more than one congestion zone, the CR must register a separate DLC program for each congestion zone and a separate load research sample shall be required for each program.

The RIDR for a DLC program shall be applied to all ESI IDs in the program, regardless of the profile segment, weather zone or congestion zone.

16.2.3 TDSP DLC Programs

TDSPs are not allowed to implement DLC programs.

(Add language to address Opt-in Entities with DLC programs)

16.2.4 Responsibilities of the Competitive Retailer

As specified in Protocols Section 18.7.2, "Load Profiling of ESI IDs Under Direct Load Control," the costs of load research samples for DLC programs shall be the responsibility of the CR requesting the Load Profile. Costs for which the CR is responsible include all costs associated with the installation, maintenance, and processing of the load research sample installed to support the DLC program. The CR is also responsible for all costs associated with demonstrating that the RIDR sample is a statistically valid representation of the DLC program population in terms of success/failure rate of the control devices and communication equipment.

To enable ERCOT to develop valid statistical samples, the CR shall notify ERCOT if any customers are separately dispatched based on congestion zone or other criteria. The notification shall occur by providing ERCOT with a list of ESI IDs for each separately dispatched group, together with a description of the criteria by which ESI IDs are assigned to one or another group. The criteria may be by random assignment, geography, size, other systematic rules, or ad hoc procedures.

To allow ERCOT to verify that the DLC program is a valid demand response program, the CR shall provide ERCOT with a description of the types of loads controlled, and of the control and communication technologies.

The CR is responsible for keeping ERCOT up-to-date on the DLC program description, as well as on characteristics of separately dispatched groups, if any. The CR shall notify ERCOT of changes to any of the information that has been provided regarding any of the following, but not limited to:

- Types of loads controlled;

- Control and communications technologies;
- Criteria by which ESI IDs are assigned to separate dispatch groups;
- Specify program ramp-up strategy, if any;
- Explicit lists of ESI IDs assigned to separate dispatch groups; or
- Significant changes in the composition of the DLC population.

The change notification shall be submitted electronically, in the same format as the original information, as an update to that information. ERCOT shall reply to the CR with an acknowledgement of receipt of the change notification. The CR shall give ERCOT sufficient advance notice of any planned changes that affect the operation of the program. These planned changes may require significant lead-time for modifications in the Sampling process to adequately construct RIDR Load Profiles to reflect the new characteristics of the DLC program. The CR shall provide an annual update to ERCOT of all information required to support ERCOT's Sampling.

A CR shall notify ERCOT, per an ERCOT-specified format, of any changes in its DLC population within three (3) business days.

To begin the process of developing a Load Profile for a new DLC program, the CR shall provide lists of ESI IDs in the DLC program directly to ERCOT. ERCOT requires this information to develop load research samples and weights. Prior to profile implementation, the CR shall directly provide any updates required by ERCOT for Sampling to ERCOT.

A CR or its designated DLC program administrator shall inform ERCOT of all control events for the DLC program. ERCOT shall use the control event information provided in the candidate proxy day screening process.

16.2.5 ERCOT Responsibilities

The Protocols Section 18.7.2, "Load Profiling of ESI IDs Under Direct Load Control," give ERCOT the responsibility for evaluating requests for DLC profiles, and for development of load research samples for these profiles. The development of the baseline methodology and the daily operations associated with producing the baseline profile is an ongoing ERCOT administrative cost.

16.2.5.1 Sampling

ERCOT is responsible for conducting the Sampling and data analysis efficiently to meet the Protocol requirements. Sampling requirements are described in Section 15, "Load Research Samples," and in the remainder of this section. These requirements shall be the same as for any other load research sample developed by ERCOT, except for rules related to data access.

The DLC population will be represented with a lagged-dynamic sample from which 15-minute interval data are collected. The sample design is anticipated to incorporate a two-dimensional stratification: one dimension being the standard profile segment (the original profile segment assigned to the ESIID prior to going on the DLC program), and the other dimension being the weather zone. The lagged-dynamic sample will serve two primary purposes: estimating the DLC load profile for settlement purposes and estimating the load reduction attributable to the DLC program during specific Balancing Up Load (BUL) related control events.

If the sample IDR data do not meet the data quality and availability standards in Section 16.2.9, "DLC Program Settlement and BUL Baseline Calculation Methodology," ERCOT shall provide a settlement exception report, for final and subsequent settlements, to the respective CR hosting the DLC program.

ERCOT is responsible for revising the RIDR used for settlement as the sample data availability improves.

ERCOT shall conduct Sample Design and implementation prudently. The sample developed for the DLC profile shall be used to support load research for development of the DLC profile and associated profile evaluation only. These confidential data shall not be used for other purposes of ERCOT or the CR except by mutual agreement between these two parties. At a minimum, the sample data, RIDR, and underlying data shall not be publicly available without the expressed written consent of the CR sponsoring the DLC program.

16.2.5.2 Validation

ERCOT shall validate the samples to ensure that unbiased procedures were used to select ESI IDs for the sample and to implement the sample in the field.

In addition to these Sampling requirements, ERCOT shall also conduct periodic audits to verify that the CR has treated sampled ESI IDs the same way they have treated other ESI IDs, in terms of dispatch operations and maintenance of dispatch equipment. ERCOT shall also validate that a functioning demand-response program exists.

16.2.5.3 Statistical Validity

The Protocols Section 18.7.2, "Load Profiling of ESI IDs Under Direct Load Control," includes several requirements regarding the statistical validity of load research samples for DLC profiles.

16.2.5.3.1 Random Selection

Sample selection shall be in "statistically random fashion" from the DLC program population. Statistically random Sampling may include any statistically valid

Sampling method so long as the estimation procedures used are consistent with the Sampling methodology.

16.2.5.3.2 Accuracy

Samples are required to meet, at a minimum, the standard of 90/10 accuracy per Protocols Section 18.7.2, "Load Profiling of ESI IDs Under Direct Load Control." This standard means that a 90 percent confidence interval has error bounds of a ±10 percent of the point estimate.

16.2.5.3.3 Adherence to the Association of Edison Illuminating Companies (AEIC) Load Research Manual

Sample Design, selection and maintenance are required by Protocols Section 18.7, "Supplemental Load Profile," to "adhere to the most recently published *AEIC Load Research Manual."* This manual describes a range of methods and approaches, and describes features of good practice and practical problems. It does not specify a unique approach or procedure for Sampling, and does not specify accuracy standards. Sampling procedures shall conform to good practice as represented in this manual.

16.2.5.3.4 Annual Verification of Statistical Validity

ERCOT shall conduct an annual verification of the statistical validity of the DLC program sample. Procedures for this verification are described below.

ERCOT shall confirm that the design accuracy levels for the Sampling variable(s) are maintained. ERCOT shall take steps to augment the sample to bring it into conformance when accuracy levels are deficient.

ERCOT shall review documentation of how the implementation of the DLC sample adhered to the random selection process specified in the Sample Design. This documentation shall include the protocols for disqualifying a site and choosing an alternate, the total fraction of selected sample that was rejected, and steps taken to keep customers from knowing they are in the sample. Also included shall be steps taken to keep the CRs from knowing which customers are in the sample.

At ERCOT's discretion a preliminary sample may be deployed to better define the required sample size or to avoid unnecessary deployment and re-deployment of samples when a program is going through substantial change, particularly during initial program start-up. After program ramp-up, ERCOT shall annually review how much the DLC population has changed compared to the original population from which the sample was drawn. Change shall be assessed in terms of, but not limited to the Sampling variables, population migrations, and the change in sample accuracy. ERCOT shall assess whether the observed

changes exceed accuracy limits and suggest that an update to the sample is needed based on the sample not being representative of the population. As part of the annual review, ERCOT shall also assess whether additional sample points are needed to make up for sample attrition. ERCOT shall establish procedures to replace lost sample points as needed.

In addition to an annual review, a dynamic sample design methodology may be implemented to accommodate significant changes in the DLC population, as determined by ERCOT. If the population used in the sample design significantly changes then the sample design needs to be evaluated and possibly refreshed and new sample sites installed, removed and/or redeployed to address changes in variability within the population.

Since the lagged-dynamic sample is anticipated to incorporate stratification by profile segment, ERCOT shall specifically monitor the impact of annual validation on the sample accuracy and representation and update the sample as appropriate.

16.2.5.4 DLC Participant Database

ERCOT shall maintain the database used to identify the population of ESI IDs participating in all DLC programs. Furthermore, ERCOT shall facilitate the registration of DLC programs in the Data Aggregation System.

If an ESI ID participates in a DLC program and switches to another CR, then, per notification from the appropriate Texas SET, ERCOT shall drop the ESI ID from the DLC program.

16.2.6 ERCOT Requested Data

To begin Sample Design for a new program, ERCOT shall initially request from the CRs all information necessary to develop the Sample Design. This information shall include:

- Lists of all ESI IDs in the program,
- Flags indicating which ESI IDs belong to which program or dispatch group if a CR has multiple programs, and
- Description of how dispatch groups are assigned, and the basis on which load control may be dispatched.

Subsequent data requests by ERCOT shall be for information needed for annual verification of validity.

16.2.7 Implementing Load Research Samples for DLC Programs

ERCOT shall arrange for the sample to be implemented by TDSPs or a third-party agent. If an ESI ID in the sample leaves the CR and/or leaves the DLC

program, a load research Interval Data Recorder (IDR) shall be installed at another randomly selected ESI ID in the program.

16.2.8 Processing Load Research Data

ERCOT shall make arrangements to process the load research data into a single RIDR for each DLC profile type. Sample interval data shall be provided to ERCOT in accordance with a method and format specified by ERCOT in consideration of the data collection systems of the providers. Sample interval data are expected to be provided in an alternate method to the standard Texas SET data exchange transactions. The TDSPs or a third party load research metering entity shall be responsible for providing the sample interval data to ERCOT in time for it to be used for final settlement. ERCOT shall arrange for the CR to receive the aggregate RIDR and appropriate weighting factors for the CR shadow settlement processes.

The TDSP or third party load research metering entity shall perform the VEE functions according to Protocols Section 10.11, "Validation, Editing and Estimation of Meter Data." TDSPs or third party load research metering entity shall pass the interval status codes with the data so ERCOT can tell which intervals have been edited. ERCOT may request, at any time, the raw sample interval data from the provider of this data for any DLC program offered.

The RIDR for each settled day is the estimate of the average load per customer for each 15-minute interval of that day. This estimated average is calculated from the sample data using Sampling weights and estimation procedures appropriate to the Sample Design. ERCOT shall determine the most appropriate expansion methodology.

16.2.9 DLC Program Settlement and BUL Baseline Calculation Methodology

If an RIDR profile from the load research sample is not available, ERCOT shall produce the RIDR using either the proxy day methodology described in Section 16.2.9.3, "Proxy Day Selection/Quality," or using the weighted sum of the standard profiles for the profile segments to which each ESI ID has been assigned, according to the Profile Decision Tree.

The CR may arrange for remote interrogation to allow actual RIDR data to be used for initial settlement. The CR shall notify ERCOT that remote interrogation is to be implemented.

For daily settlements, the lagged-dynamic sample will be used to develop the RIDR for the DLC population. ERCOT is responsible for providing an exception report to the CR sponsoring a DLC program when the interval sample data is insufficient to produce a RIDR. As additional sample data becomes available,

ERCOT shall develop revised RIDRs for subsequent settlements and re-settlements.

When a DLC program participates in the BUL market, after-the-fact load reduction estimates also are required as the basis for qualifying (or re-qualifying) the program for participation in BUL, as the basis for compensation for BUL load reductions, and for assessing the performance of the DLC program with respect to BUL standards specified in Protocols Section 6, “Ancillary Services.” To accomplish these objectives, a baseline load shape must be estimated for the DLC program for the BUL control day as if the control event(s) had not taken place. The estimated load reductions, on an interval-by-interval basis, are then computed by subtracting the lagged-dynamic sample load from the baseline load.

16.2.9.1 Data Sources

Based on interval data availability and quality for the trade (settlement) day and for a suitable proxy day, Table 2 below shows which profiles should be used as the data source for settlement and which should be used as the source data for computing a baseline profile. The data quality and availability standards are the same for all settlements: initial, final, true-up and re-settlement. If insufficient data from the lagged-dynamic sample is available for a control day at the time a settlement is run, a baseline profile is not estimated.

Table 2
Data Sources for DLC Settlement and Baseline Determination

Lagged-dynamic Sample Data Quality on Trade Day	Proxy Day Available which Meets Criteria	Trade Day Settlement Profile Data Source	BUL Control Day Baseline Profile Data Source
≥90%	Yes	Lagged-dynamic Sample on Trade Day	Lagged-dynamic Sample on Proxy Day
≥90%	No	Lagged-dynamic Sample on Trade Day	Standard Profile on Trade Day
<90%	Yes	Lagged-dynamic Sample on Proxy Day	Not Estimated
<90%	No	Standard Profile on Trade Day	Not Estimated

16.2.9.2 Lagged-dynamic Sample Data Quality On Trade Day

The trade day profile is developed from the lagged-dynamic sample if sufficient sample data is available to produce the sample RIDR estimates for that day. The trade day profile is applicable for settlement, as shown in Table 2, only if 90% or more of the sample points in the sample design (including any sample over-sizing) have 100% of their data available and valid for the trade day. For example, if the sample design calls for 100 points then at least 90 of the sample sites must have valid data for all of the intervals on the trade day in order for the lagged-dynamic profile to be used for settlement. Sample points for which some or all of the interval data is missing for the trade day are not included in producing the sample RIDR.

16.2.9.3 Proxy Day Selection/Quality

Candidate proxy days are identified from a database maintained by ERCOT of historical lagged-dynamic sample daily profiles and then screened on the basis of six criteria:

1. Data quality standard (90%).
2. Non-control day (including BUL and other controls).
3. Same day-type.
4. Within 365 days (before or after) of trade day.
5. Similar weather on proxy day and trade day (i.e., the coefficient of correlation is greater than or equal to 0.90)
6. Maximum temperature on proxy day and trade day occurring with two hours and 5º F of each other.

Criterion 1: The candidate proxy days shall meet or exceed the interval data quality standards specified in Section 16.2.9.1, “Data Sources,” for the trade day. Days in the database not meeting the data quality standard are excluded from further consideration as a proxy day.

Criterion 2: The candidate proxy day cannot be a day during which any type of load control was implemented for the DLC program. The DLC program administrator shall inform ERCOT of all control events for the DLC program, whether BUL related or otherwise, and ERCOT will be responsible for using the information provided in the candidate proxy day screening process.

Criterion 3: The candidate proxy day and trade day must have the same day-type where the day-types are non-holiday weekday, non-holiday weekend day, and holiday. If the trade day is a holiday, the proxy day must be another holiday or a Sunday. Holidays consist of New

Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day.

Criterion 4: The candidate proxy day must have occurred within 365 days (before or after) of the trade day.

Criterion 5: The coefficient of correlation between the dry-bulb temperature readings (weighted weather zone data) on the candidate proxy day and the trade day must be greater than or equal to 0.90.

Criterion 6: The maximum temperatures on the candidate proxy day and on the trade day must occur within two hours and 5º F of each other. The DLC proxy day methodology does not use the weather sensitive proxy day methodology as detailed in Protocols Section 11, "Data Acquisition and Aggregation."

Candidate proxy days, if any, passing the six screening criteria are then ranked as follows:

1. Compute the sum of the squared differences between the hourly temperatures of the trade day and the hourly temperatures of the candidate proxy day.
2. Compute the incremental change in temperature from hour to hour for the trade day and candidate proxy day. Sum the squared differences between the corresponding values for the trade day and the candidate proxy day.
3. The sums computed in (1) and (2) are combined using an appropriate weighting scheme. The initial weighting scheme shall be 0.7 and 0.3 for the results of (1) and (2) above, respectively. However, given the critical importance of the weights used for the settlement of DLC, the weighting scheme will be subject to continuous improvement process based on thorough research and validation.

The candidate proxy day with the lowest weighted sum is deemed to be the "best" proxy day and is used for settlement and baseline determination purposes. If no candidate proxy day passes all the screening criteria, then a proxy day is not used for settlement or baseline determination.

16.2.9.4 Trade Day Profile Weighting

As stated in Section 16.2.5.1, "Sampling," the lagged-dynamic sample is stratified by profile segment and weather zone. Since the size and makeup of the DLC population are likely to fluctuate significantly over time and inter-strata migration is likely to be minimal (other than during annual validation), stratum weights will be dynamically determined for each trade day (rather than using static weights determined at the time of sample selection) from ERCOT's DLC population

database. Therefore, the DLC lagged-dynamic RIDR profile will be the weighted sum of the stratum level profiles using the dynamically determined weights.

16.2.9.5 Proxy Day Profile Weighting

When the proxy day is being used to estimate loads for the trade day or for estimating loads on the trade day absent a control event, the dynamically determined stratum weights on the trade day are applied to the stratum level sample loads on the proxy day. The weighted sum of the stratum level profiles is then used as the composite DLC profile for the trade day.

16.2.9.6 Standard Profile Weighting

When using the standard profile to estimate loads for the trade day or for loads on the trade day absent a control event, the dynamically determined stratum weights on the trade day are applied to corresponding standard profile loads. The weighted sum of the standard profiles is then used as the composite DLC profile for the trade day.

16.2.9.7 Baseline Profile Determination

The comparison profile is defined as either the proxy day or the standard day profiles as specified in Table 2 shown above under the column heading "BUL Control Day Baseline Profile Data Source." The comparison profile is used in conjunction with the lagged-dynamic profile on the day of a BUL control event to determine the BUL baseline profile.

The control period is defined as the set of intervals during which the curtailment occurred for the BUL bid period; the extended control period is defined as the control period, the four intervals immediately preceding the control period and the four intervals immediately following the control period, and any other DLC curtailment period for the trade day. The following sums shall be determined: the sum of the intervals for the comparison profile for the extended control period ($CKWH_{com}$), the sum of the intervals for the day but not in the extended control period for the comparison profile ($NCKWH_{com}$), and the sum of the intervals for the day not in the extended control period for the lagged-dynamic profile ($NCKWH_{ld}$). The baseline kWh ($CKWH_{base}$) for the extended control period is computed using the following formula:

$$CKWH_{base} = NCKWH_{ld} \times \frac{CKWH_{com}}{NCKWH_{com}}$$

Producing the baseline profile then consists of two steps. In the first step, $CKWH_{base}$ is allocated to each of the baseline intervals in the extended control period proportional to the magnitude of the corresponding intervals in the comparison profile.

For the second step, all intervals in the lagged-dynamic profile not included in the control period are assigned to the corresponding intervals in the baseline profile thus completing the profile. This step overwrites the values of the first and last four intervals of the extended control period produced by the initial allocation step.

16.2.9.8 Quality Assurance and Analysis

ERCOT shall review and analyze the DLC Proxy Day and Baseline methodology for settlement after the first full year of operation of an approved DLC Program. ERCOT shall then make recommendations to the appropriate ERCOT TAC subcommittee. The recommendations will address the accuracy of this process and, if appropriate, a suitable replacement process and its anticipated benefits over the current process.

The ERCOT analysis of the DLC program Proxy Day determination and Baseline calculation methodology will include a review of the impacts to non-DLC standard profiles. Any recommended replacement process is expected to produce more accurate settlements and shall be analyzed for further refinement annually.

16.2.10 Verifying Sample Validity

The Protocols require ERCOT to verify that the sample reflects the success/failure rates of control devices and of communication equipment. The following procedures shall be used for this verification.

16.2.10.1 Basic Verification Procedure

An audit of the CR's DLC Program maintenance records and work orders is the basic procedure for verifying that the sample is representative of the population. The purpose of this audit is to establish that the sampled customers are treated no differently from other customers in terms of maintaining the effectiveness of control devices and signals.

For purposes of this audit, the CR shall make available to ERCOT work order records for installation, maintenance and other customer service calls. These records shall be identifiable by ESI ID.

16.2.10.2 Expanded Verification Procedure

An expanded verification may be implemented by ERCOT, if the results of the basic verification procedures warrant it. The expanded review may include more comprehensive or more detailed studies. For example, studies may be conducted of signal and switch failure rates by conducting field tests of signal receipt and switch performance for a statistical sample. Load impacts for devices successfully controlled may be estimated by installing sub-metering equipment on the controlled end-uses for a sample of ESI IDs in the program.

16.2.10.3 No Verification Required for Census Samples

No audit or other verification is required if the load research sample includes a census of all customers in the program.

16.2.10.4 Timing of Sample Verification Audits

Audits shall be conducted after one (1) year of installation of the full sample and at least every two (2) years thereafter. Prior to conducting an audit after less than two (2) years from a previous audit, ERCOT shall give the CR at least thirty (30) days advance notice of the intent to conduct a more frequent audit.

16.3 Other Supplemental Load Profiles

Other supplemental Load Profiles may be developed for other types of programs or pricing schemes that encourage a demand response to price in the retail market after Market Open. At Market Open, the only supplemental profiles permitted by ERCOT system functionality are TOU. System functionality may be available for DLC programs by late 2002.

Methodologies for any other supplemental Load Profile will be evaluated on a program by program basis. Procedures and requirements for developing these profiles shall be the same as those described in Section 16.2, “Direct Load Control,” except where specified in Section 16.4, “Requesting DLC or Other Supplemental Load Profile.”

16.4 Requesting DLC or Other Supplemental Load Profile

To request development of a new supplemental Load Profile, the CR shall adhere to the guidelines below.

16.4.1 Who May Submit a Request for a Supplemental Load Profile

Only the CR serving the customers on a demand-responsive scheme may request a supplemental Load Profile to serve those customers.

16.4.2 Procedure for Submitting a Request

ERCOT shall post to its public website a form to request a new supplemental profile. A completed application form shall accompany all requests for a new supplemental profile or for inclusion of a different CR’s program with an existing profile.

16.4.3 Required Information

The CR shall provide sufficient information to ERCOT to allow ERCOT the ability to construct a representative Sample Design that accurately estimates the DLC or supplemental program load.

16.4.4 Process Timing for Requesting Changes

Requests for a supplemental profile may be submitted to ERCOT at any time. Within two (2) business days of receiving the request, ERCOT shall reply to the requestor indicating that the request has been received.

ERCOT shall respond to the request within sixty (60) days. This period does not include the time to develop and implement a load research sample. The response shall indicate:

- That the request is complete;
- Any questions affecting Sampling that ERCOT has regarding the program or its customers;
- The time for approval of a new sample or incorporation within an existing sample is expected to be ready;
- The time the revised Sampling or profile applications are expected to be implemented, if approved.

During ERCOT's evaluation of the request, ERCOT may request supplemental information determined to be important to justifying the new supplemental profile or merger with an existing profile.

16.4.5 Response to the Request

Upon receipt of the request to develop a new profile, ERCOT shall verify that the request is complete, including a minimum amount of information necessary to develop an appropriate Sample Design.

ERCOT shall implement a new load research sample for DLC or other supplemental profiles within six (6) months of final agreements between CR and ERCOT on the Sample Design of the requested program.

16.5 Access to Data

(Details forthcoming)

16.5.1 Access to the Sponsored Load Profiles

(Details forthcoming)

16.5.2 Access to Data for Individual ESI IDs in the DLC Sample

(Details forthcoming)

ERCOT Load Profiling Guide
Section 17: Load Profile Metering

September 1, 2006

17 Load Profile Metering

17.1 Introduction

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 TDSPs are the only entities authorized to provide settlement meter data to ERCOT in accordance with Protocols Section 10, "Metering."

Each 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:

- To allocate daily load for settlement and aggregation process;
- To allow validation for Load Profile ID assignments;
- To ensure profile models are appropriately specified; and
- To allow for profile model development.

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.

This section addresses the following topics:

- IDR Requirement;
- Demand Meter Changes;
- Load Research Samples; and
- Supplemental Profiling.

Details for metering activities may be found in Protocols Section 10, "Metering."

17.2 IDR Requirement

Interval Data Recorders (IDRs) shall be installed or removed in accordance with Protocol Section 18.6, Installation and Use of Interval Data Recorders and Retail Market Guide (RMG) Section 7.13, Interval Data Recorder (IDR) Optional Removal/Installation Process.

Costs associated with mandatory installation of IDRs by 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 TDSPs”, 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 TDSP determines that a demand meter should be changed based on the TDSP metering tariff rules, the TDSP shall notify the CR prior to making the meter 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.
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 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 do 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 Protocols Section 18.4, “Assignment of Load Profile Types and Weather Zones.” 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

Any IDRs installed as part of the load research program, i.e., in support of ERCOT Load Profiling or TDSP cost allocation/rate design, are not subject to the IDR requirements stated in Protocols Section 18.6.1, “Interval Data Recorder (IDR) Installation and Use in Settlement.” These IDRs used for load research may be moved as needed.

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

If a CR wants supplemental Load Profiling (i.e., DLC, TOU, etc.), the CR shall follow procedures in Section 16, “Supplemental Load Profiling.” Metering for supplemental Load Profiling shall be in accordance with Protocols Section 10, “Metering,” and Protocols Section 18, “Load Profiling.”

All IDR installations for supplemental Load Profiling shall be consistent with IDR metering requirements in Protocols Section 10.9.2, “TDSP Metering Entities.” Additionally, any Time-of-Use (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

September 1, 2006

18 Access to Load Profiling Materials

A variety of Load Profiling related documents and materials are available on ERCOT's website, www.ercot.com.

Daily Load Profiling market information may be found at
http://www.ercot.com/ercotPublicWeb/MarketInformation/LoadProfiling.htm.
At this site are:

1. Backcasted (Actual) Load Profiles – Extract files of actual Load Profiles for all Load Profiles for each trade day. The trade day occurring two (2) days prior to the current date will be the most current backcast available. The files may also include backcasted Load Profiles for additional days other than the most current backcast.
2. Forecasted Load Profiles – Extract files include current day and three (3) days forward of forecasted Load Profiles.
3. A link to the Load Profiling documents listed below.

Load Profiling documents may be found at
http://www.ercot.com/Participants/loadprofiling.htm.
At this site are:

1. Profile File Format – Spreadsheets that illustrate the layout of the profile extract files.
2. Profile Decision Tree – Tool that provides direction in making Load Profile assignments.
3. Profile Model Spreadsheets – Tools that simulate Load Profiles for user-defined scenarios.
4. Final Profile Model Report – Report that describes ERCOT Load Profiles for pilot program and Market Open.
5. Load Profile History – Fifty-two (52) months of Load Profile history in kWh for each Profile Type and Weather Zone. Includes hourly and 15-minute interval data.
6. Historical Weather Data by Weather Zone – Five (5) years of historical hourly weather data by Weather Zone, covering 1996-2000.
7. Profile Types and Weather Zones – Definitions of approved Profile Types and Weather Zones for pilot program and Market Open.
8. Profile Data Evaluation Report – Documents that provide an evaluation of the utility data used to generate the ERCOT Load Profile models.

The Calendar of Events at http://www.ercot.com/calendar/Cal.cfm provides information on the Profiling Working Group (PWG) meetings.

The Profiling Working Group meeting information may be found at http://www.ercot.com/Participants/Committees/pwg_comm.htm.

ERCOT Load Profiling Guide
Appendix A

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Appendix A

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ERCOT Load Profiling Guide
Appendix B

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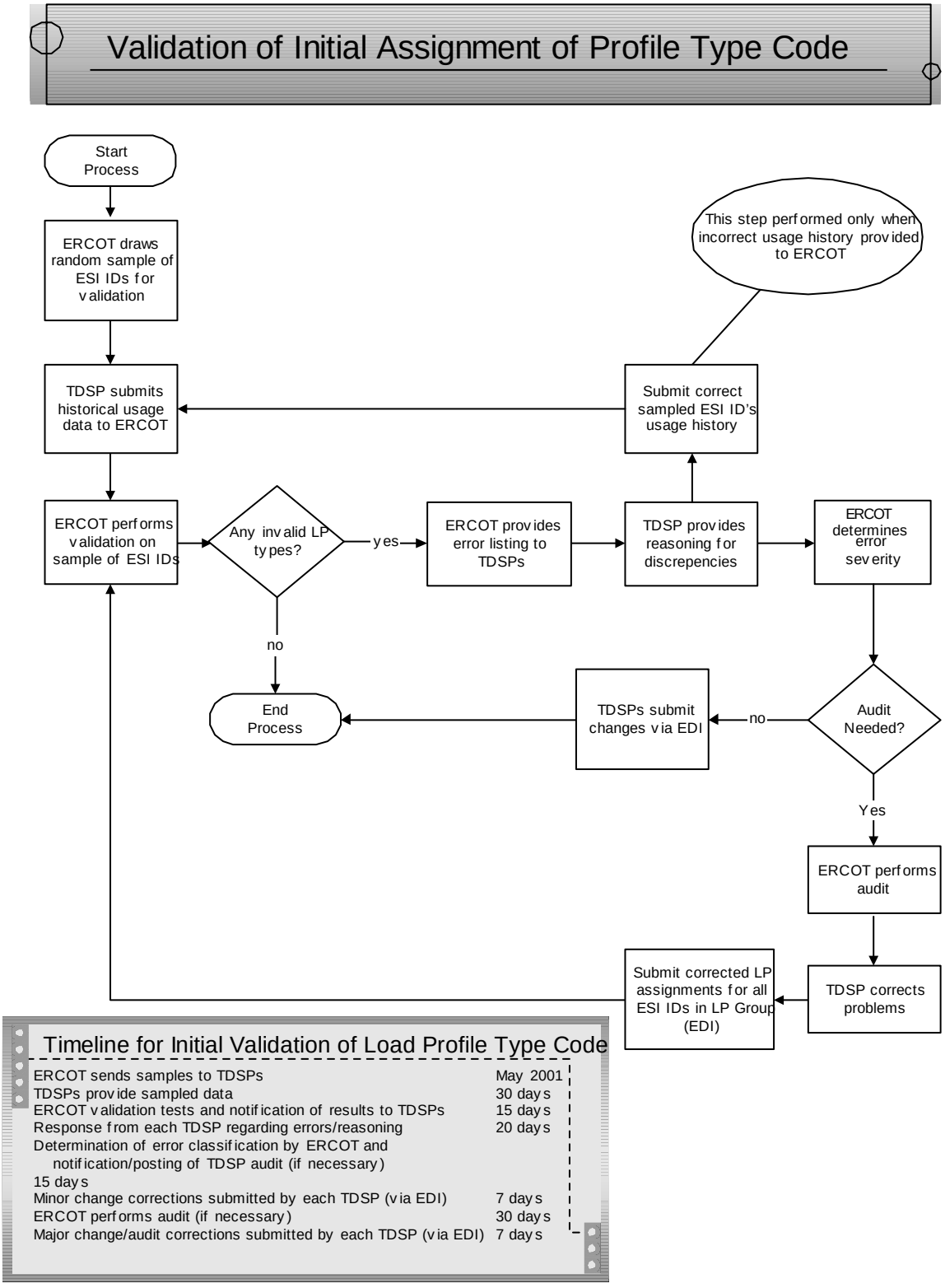
Appendix B


Validation of Initial Assignment of Profile Type Code
Start Process
ERCOT draws random sample of ESI IDs for validation
TDSP submits historical usage data to ERCOT
ERCOT performs validation on sample of ESI IDs
Any invalid LP types?
yes
ERCOT provides error listing to TDSPs
TDSP provides reasoning for discrepencies
ERCOT determines error severity
Audit Needed?
no
TDSPs submit changes via EDI
End Process
Yes
ERCOT performs audit
TDSP corrects problems
Submit corrected LP assignments for all ESI IDs in LP Group (EDI)
Submit correct sampled ESI ID's usage history
This step performed only when incorrect usage history provided to ERCOT
Timeline for Initial Validation of Load Profile Type Code
ERCOT sends samples to TDSPs May 2001
TDSPs provide sampled data 30 days
ERCOT validation tests and notification of results to TDSPs 15 days
Response from each TDSP regarding errors/reasoning 20 days
Determination of error classification by ERCOT and notification/posting of TDSP audit (if necessary)
15 days
Minor change corrections submitted by each TDSP (via EDI) 7 days
ERCOT performs audit (if necessary) 30 days
Major change/audit corrections submitted by each TDSP (via EDI) 7 days

ERCOT Load Profiling Guide
Appendix C

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Appendix C

Measuring Differences Between Load Profiles

This Appendix describes and illustrates measures that may be used for assessing the differences between Load Profiles.

Differences between Load Profiles are a consideration in many decisions regarding Load Profiling methods and models, such as:

- Evaluating Load Profile model performance or methodologies (Section 8, "Load Profile Models," and Section 7, "Requests for Changes to Load Profiling Methodology,")
- Evaluating requests for changes to segments or Weather Zones (Section 12, "Request for Profile Segment Changes, Additions, or Removals," and Section 13, "Changes to Weather Zone Definitions,") and
- Designing load research samples (Section 15, "Load Research Samples.")

Target and Default Load Profiles

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.

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 table below.

Table C-1
Examples of Target and Default Profiles

Question	Target Profiles	Default Profile
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 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

Series parameters include

- Unitized load shape, or interval fractions
- Monthly fractions
- Daily fractions
- Clock-hour fractions by day-type

Unitized Load Shapes

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.

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.

The unitized load f_t for time interval t is calculated from the interval loads L_t as

f_t = (Load at interval t)/(sum of loads over all intervals in the period).
$= L_t / T$

where

$$T = \Sigma_t L_t$$

and the summation is over all intervals in the period.

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 (4) 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

fM_m = (sum of interval loads in month m)/ (sum of all interval loads in the year)
= $(\Sigma_{t \in Mm} L_t)/ (\Sigma_t L_t)$.
= TM_m/ TY.

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

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

fD_d = (sum of interval loads in day d)/ (sum of all interval loads in the period)
= $(\Sigma_{t \in Dd} L_t)/ (\Sigma_t L_t)$.
= TD_d/T

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.

This calculation gives one daily fraction for every day of the month or year.

Clock-Hour Fractions by Day-type

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.

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

Single Parameters

Single parameters include

- Load factor
- On-/off-peak ratio
- Seasonal consumption ratio
- Weekday fraction
- 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

Average load factor is an average of monthly load factors. This average is computed as

$$AvgLF = \left[\frac{\left(\sum_{m=1}^{12} \text{AHUse}_m \right)}{\sum_{m=1}^{12} \text{MaxKW}_m} \right]$$

where

AHUse_m = average hourly use in billing month m
= KWh_m/(billing days x 24)
MaxKW_m = maximum metered kW demand in billing month m

This definition and notation are consistent with the profile assignment decision tree.

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,

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

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

$r_{on/off}$ = (on-peak consumption)/(off-peak consumption)
= T_{ON}/T_{OFF}

where

T_{ON} = sum of interval loads over all intervals in on-peak periods
T_{OFF} = sum of interval loads over all intervals in off-peak periods.

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

$r_{S1/S2}$ = (total for season 1)/(total for season 2)
= TS1/TS2

where TS1 and TS2 denote totals of interval loads over the two seasons being compared.

Load-Weighted Average or Annual Price

The load-weighted average price U for a period is calculated as

$$U = \Sigma_t L_t u_t / \Sigma_t L_t$$

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.

Equivalently, the load-weighted average price may be calculated from the unitized loads as

$$U = \Sigma_t f_t u_t.$$

where f_t is the unitized load defined above.

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.

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

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.

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

Simple parameters are those that represent a load shape in terms of a single number. These parameters include the following:

- Load factor
- On-/off-peak ratios
- Seasonal consumption ratios
- Load-weighted average price.

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

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

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

A Load Profile over a year may be characterized by:

- its unitized load shape,
- the separately unitized load shapes for each month,
- the 12 monthly fractions,
- the 24 clock-hour fractions for the year, or
- the set of 24 clock-hour fractions for each month or day-type.

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 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:

1. Taking the difference between the default and target for each element in the series
2. Taking the mean of these differences over all terms in the series.

Mean Absolute Deviation (MAD)

The mean absolute deviation or MAD is calculated by:

1. Taking the difference between the default and target for each element in the series
2. Taking the absolute value of each difference
3. Taking the mean of these absolute differences over all terms in the series.

Thus,

$$MAD = (1/J) \Sigma_j |X_{TARGETj} - X_{DEFAULTj}|$$

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 mean absolute percent error or MAPE is calculated by:

1. Taking the difference between the default and target for each element in the series
2. Taking the absolute value of each difference expressing this absolute value as a percent of the target value
3. Taking the mean of these absolute percent errors over all terms in the series.

Thus,

$$MAPE = (1/J) \Sigma_j |X_{TARGETj} - X_{DEFAULTj}|/X_{TARGETj}$$

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 root mean square error or RMSE is calculated by:

1. Taking the difference between the default and target for each element in the series
2. Squaring each difference
3. Taking the mean of the squared difference over all terms in the series
4. Taking the square root of the mean squared difference.

Thus,

$$RMSE = \sqrt{(1/J)\sum_j \left(X_{TARGET_j} - X_{DEFAULT_j}\right)^2}$$

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 profiles that are jointly affected by a possible change. Key examples of such decisions are to either:

- Subdivide an existing segment into smaller segments,
- Subdivide an existing Weather Zone into smaller Weather Zones,
- Change segment definitions in a way that shall affect multiple segments, or
- 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 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

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 Profiles."

The combined effect of subdividing may be expressed as the deadweight loss reduction. The calculation formula is

$$\Delta DWL = \tfrac{1}{2}\, e\, \Sigma_k\, E_k\, U_0\, ((U_k - U_0)/U_0)^2$$

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).

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.

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 profile segment, and summed over segments to provide the total benefit of the Weather Zone subdivision.

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.

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 profile, while the remainder shall continue to have the existing profile, the deadweight loss formula reduces to

$$\Delta DWL = \tfrac{1}{2} e \; E_{k^*} U_0 ((U_{k^*} - U_0)/U_0)^2$$

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

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:

- Changing a Weather Zone boundary so that a portion is removed from one zone and added to another
- Changing a set of profile segment definitions so that part of one segment is shifted from one to another
- Choosing between two alternative schemes for defining Weather Zones or profile segments.

Any of these choices may be assessed as a difference among possible subdivisions using the formula in this Appendix 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.

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.

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.

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

The 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 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

				Existing Profile Segment		Profile Subsegment A		Profile Subsegment B	
	Day	Hour	Price ($/MWh)	Load (MWh)	Hourly Cost	Load (MWh)	Hourly Cost	Load B (MWh)	Hourly Cost
	d	h	u_t	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
SUM			**$3,144**	**68150**	**$5,839,250**	**64100**	**$5,183,500**	**72200**	**$6,495,000**

The deadweight loss due to using the current profile model (default) rather than the target is calculated as

$$DWL = \tfrac{1}{2}\, e\, E\, U_{DEFAULT}\, ((U_{TARGET} - U_{DEFAULT})/U_{DEFAULT})^2$$

Where

e = elasticity of electricity demand with respect to the commodity price

E = total energy consumption for the profile segment (MWh)

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

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

Illustration of Measures of Differences

To illustrate some of the measures of differences, the table below 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 through1900 military time.

Hypothetical Loads and Prices for Illustration

The next table 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
Load-weighted average price	**$85.68**	**$80.87**	**$89.96**
On-peak Energy	36,650	35,900	37,400
Off-peak Energy	31,500	28,200	34,800
On-/off-peak ratio	**1.16**	**1.27**	**1.07**
Profile Peak Load	2,300	1,900	2,700
Load Factor	**0.62**	**0.70**	**0.56**
DIFFERENCES FROM EXISTING			
Load-weighted average price		-4.8	4.3
On-/off-peak ratio		0.11	-0.09
Load Factor		0.09	-0.06

The next table shows the calculations of daily and clock-hour totals and fractions.

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

			Existing Segment		Subsegment A		Subsegment B	
	Day	Hour	Totals	Fractions	Totals	Fractions	Totals	Fractions
Daily								
	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
	SUM		**68,150**	**1.00**	**64,100**	**1.00**	**72,200**	**1.00**
Clock-Hour								
		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
		SUM	**68,150**	**1.00**	**64,100**	**1.00**	**72,200**	**1.00**

The next table 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

		Unitized Loads			Difference from Existing		Absolute Difference		Squared Difference		Absolute Percent Difference	
Day	Hour	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 profile. The differences or errors between each segment and the existing 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.

The final table illustrates a calculation of the reduction in deadweight loss achieved by changing from the single existing profile to separate 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	ΔDWL	$22,872			

ERCOT Load Profiling Guide
Appendix D

June 29, 2007

Appendix D

Profile Decision Tree

See electronic Microsoft Office Excel© file on the ERCOT Website

[Annual Profile Decision Tree Updates (BUS Profile): Effective on August 15, 2007]

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

[LPGRR017: Implementation of BUSOGFLT Profile Type Effective on September 18, 2007]

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

[LPGRR018: Default Residential Profile Segment and Clean Up of Valid Profile IDs Tab Effective on November 1, 2007]

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

ERCOT Load Profiling Guide
Appendix E

May 15, 2007

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.

ERCOT Load Profiling Guide
Acronyms and Glossary

May 1, 2007

ACRONYMS AND GLOSSARY

Acronyms

AEIC	Association of Edison Illuminating Companies
BUSNODEM	Business No Demand
COPS	Commercial Operations Subcommittee
CR	Competitive Retailer
DLC	Direct Load Control
EDI	Electronic Data Interchange
EPS	ERCOT Polled Settlement
ERCOT	Electric Reliability Council of Texas
ESI ID	Electric Service Identifier
IDR	Interval Data Recorder
LPG	Load Profiling Guides
LPGRR	Load Profiling Guides Revision Request
MAD	Mean Absolute Deviation
MAPE	Mean Absolute Percent Error
MIS	Market Information System
NERC	North American Electric Reliability Corporation
NIDR	Non-Interval Data Recorder
NOAA	National Oceanic and Atmospheric Administration
NOIE	Non-Opt In Entity
NOTOU	Non-Time-of-Use
NWS	Non-Weather Sensitive
PUCT	Public Utility Commission of Texas
PURA	Public Utility Regulatory Act, Title II, Texas Utility Code
PWG	Profiling Working Group
QSE	Qualified Scheduling Entity
RIDR	Representative Interval Data Recorder
RMSE	Root Mean Square Error
TAC	Technical Advisory Committee
TDSP	Transmission and/or Distribution Service Provider
TOU	Time-of-Use
UFE	Unaccounted for Energy

Glossary

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;

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 ESI IDs. ERCOT then works with the TDSPs to have them update ERCOT's databases with the resulting Profile ID changes via Texas SET transactions.

B [BACK TO TOP]

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

C [BACK TO TOP]

Competitive Retailer (CR)
Municipally Owned Utility or an Electric Cooperative that offers Customer Choice and sells electric energy at retail in the restructured electric power market in Texas, or a Retail Electric Provider (REP) as defined in PUCT Substantive Rules 25.5.

Cutover and Conversion
Initial data transfer of TDSPs ESI ID data into the ERCOT systems.

D [BACK TO TOP]

E [BACK TO TOP]

Electric Reliability Council of Texas, Inc. (ERCOT)

A Texas nonprofit corporation that has been certified by the PUCT as the Independent Organization, as defined in §39.151 of PURA, for the ERCOT region.

Electric Service Identifier (ESI ID)
The basic identifier assigned to each Service Delivery Point used in the registration and settlement systems managed by ERCOT or another Independent Organization.

Active ESI ID

ESI I D is presently receiving service (energized) and a REP is currently assigned to it in ERCOT's system.

De-Enegized ESI ID

ESI ID does not have a REP assigned in ERCOT's system, but has not been retired. An 814_16 Move-In 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.

Entity
Any natural person, partnership, municipal corporation, cooperative corporation, association, governmental subdivision, or public or private organization.

ERCOT Board
The Board of Directors of the Electric Reliability Council of Texas.

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IDR Requirement
The kW level at which the installation of interval data recorders are required for settlement purposes as set forth in Protocols Section 18.6.1, "Interval Data Recorder (IDR) Installation and Use in Settlement."

Interval Data Recorder (IDR)
Metering device that is capable of recording load usage in each Settlement Interval in accordance with Protocols Section 9, “Settlement and Billing,” and Protocols Section 10, “Metering.”

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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
A representation of the energy usage of a group of Customers, showing the demand variation on an hourly or sub-hourly basis.

Load Profile Class

From Protocols, Section 2: "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: 1) the Load Profile Type Code; 2) the Weather Zone Code; 3) the Meter Data Type Code; 4) the Weather Sensitivity Code; and 5) the Time-Of-Use Schedule Code. An example of a Profile ID: RESLOWR_FWEST_NIDR_NWS_NOTOU.

Load Profile Models
Processes that use analytical modeling techniques to create Load Profiles.

Load Profile Type
A classification of a group of ESI IDs having similar energy usage patterns and that are assigned the same Load Profile.

Load Profiling
The set of processes used for the development and creation of Load Profiles.

Load Profiling Methodology
The fundamental basis on which Load Profiles are created. The implementation of a Load Profiling Methodology may require statistical Sampling, engineering methods, econometric modeling, or other approaches.

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

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Market Information System (MIS)
An electronic communications interface established and maintained by ERCOT that provides a communications link to Market Participants, including secure access by and communications to individual Market Participants regarding information linked to each individual Market Participant.

Market Open
January 1, 2002

Market Participant
An Entity that engages in any activity that is in whole or in part the subject of these Protocols, regardless of whether such Entity has executed an Agreement with ERCOT.

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 TDSP and used for settlement.

Municipally Owned Utility

A utility owned, operated, and controlled by a municipality or by a nonprofit corporation, the directors of which are appointed by one or more municipalities.

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Non-Metered Load or Group
Load that is not required to be metered by applicable distribution or transmission tariff.

Non-Opt In Entity (NOIE)
An Electric Cooperative or Municipally Owned Utility that does not offer Customer Choice.

North American Electric Reliability Corporation (NERC)
The national organization that is responsible for establishing standards and policies for reliable electric system operations and planning, or its successor.

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Operating Guides
Guidelines approved by the ERCOT Board describing the reliability standards for ERCOT.

Opt-In Entity

A Municipally Owned Utility or Electric Cooperative opting-in to Customer Choice

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Power Factor
The ratio of real power (kW) to the apparent power (kVa) for any given load and time.

Premise
A Service Delivery Point or combination of Service Delivery Points that are assigned a single Electric Service Identifier (ESI ID) for purposes of settlement and registration.

Profile Decision Tree

The document that contains the directions for determining the Load Profile ID to be assigned to an ESI ID

Profile Type
***See* Load Profile Class**

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Qualified Scheduling Entity
A Market Participant that is qualified by ERCOT in accordance with Protocols Section 16.2, "Registration and Qualification of Qualified Scheduling Entities", to submit Balanced Schedules and Ancillary Services bids and settlement payments with ERCOT.

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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 Representative IDR (RIDR) for profiling these premises.

Residential (RES)

Load Profile Group designation for ESI IDs served within a residential rate class.

Retail Electric Provider (REP)
A person that sells electric energy to retail Customers in this state. As provided in PURA §31.002(17), a Retail Electric Provider may not own or operate generation assets. As provided in PURA §39.353(b), a Retail Electric Provider is not an Aggregator.

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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.

Sampling
The process of selecting a subset of a population of Customers that statistically represents the entire population.

Season

Winter months are December, January, and February; Spring months are March, April, and May; Summer months are June, July, and August; Fall months are September, October, and November.

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.

Service Address
The street address associated with an ESI ID as recorded in the registration database. This address shall conform to United States Postal Service Publication 28.

Service Delivery Point
The specific point on the TDSP's system where electricity flows from the TDSP to a load.

Settlement Interval
The time period for which a Market Service is deployed and financially settled. For example, the currently defined settlement interval for the Balancing Energy Market Service is 15 minutes.

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

Technical Advisory Committee (TAC)
A subcommittee in the ERCOT governance structure reporting to the Board of Directors as defined by the ERCOT bylaws.

Texas SET
Protocols Section 19, "Texas Standard Electronic Transaction (SET)," procedures used to transmit information pertaining to the Customer registration database. Record and Data Element Definitions are provided in a data dictionary in Protocols Section 19, "Texas Standard Electronic Transaction (SET)."

Time-of-Use Metering
A programmable electronic device capable of measuring and recording electric energy in pre-specified time periods. For Load Profiling purposes Time-of-Use Metering does not include IDRs.

Time-of-Use Schedule

A schedule identifying the Time-of-Use period associated with each Settlement Interval. These schedules may include on-peak, off-peak, and shoulder periods.

Transmission and/or Distribution Service Provider (TDSP)
An Entity that owns or operates for compensation in this state equipment or Facilities to transmit and/or distribute electricity, and whose rates for Transmission Service, distribution service, or both is set by a Governmental Authority.

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Unaccounted for Energy (UFE)
The difference between total metered loads each Settlement Period, adjusted for applicable Distribution Losses and Transmission Losses, and total ERCOT System net generation.

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**

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Validation, Editing, Estimation of Meter Data

***See* Section 10, "Metering"**

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Weather Zone
A geographic region in which climatological characteristics are similar for all areas within such region.

Winter Ratio

The proportion of usage in winter months to usage in the FallBase and SpingBase months and is used to differentiate Residential ESI IDs.

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