

ERCOT CORPORATE STANDARD

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Governs:	ERCOT Personnel
Approved:	Board of Directors, ERCOT, Inc.

1. Purpose

This Market Credit Risk Corporate Standard provides a framework by which the ERCOT Board of Directors seeks to maintain the long-term financial integrity of the ERCOT market and to help ensure that overall market credit risk is maintained within acceptable limits.

Recognizing that a number of risk factors contribute to overall market credit risk and that it is beneficial to quantify and describe these risks, a model has been developed to help evaluate the combined impact of key market credit risk factors.

This standard and the output of the Potential ~~Future Exposure~~ Credit Risk Model do not change collateral requirements or Market Participant obligations to comply with those collateral requirements under the ERCOT Protocols. Changes to collateral requirements require a change to ERCOT Protocols through Section 21, Process for Protocol Revision.

2. Definitions

Terms & Acronyms	Definition / Description
Base Case	The Potential Credit Risk Model scenario that considers only forms and amounts of collateral required by the ERCOT Protocols.
BOD	Board of Directors
Current Case	The Potential Credit Risk Model scenario that considers forms and amounts of collateral held as of a specific point in time. This scenario may include collateral amounts above those required by the ERCOT Protocols and which may be unilaterally withdrawn at the Counter-Party's direction.
CWG	Credit Work Group
Expected Loss	The average – although not the most common – outcome across all model outcomes. It represents the loss the ERCOT market as a whole should expect to incur over time under given market conditions as a result of its portfolio credit risk.
Loss Distribution	A range of potential losses under a specific set of parameters with a given probability of occurrence

Terms & Acronyms	Definition / Description
Potential Future Exposure Credit Risk (PFPCR) Model	The financial model that ERCOT uses to measure potential credit risk. It is constructed using a standard Potential Future Exposure framework that produces a portfolio Loss Distribution of potential losses.
Potential Future Exposure Credit Risk (PFECR) Report	A report that summarizes the results from the PFECR Model together with ERCOT's analysis.
Potential Future Exposure	An estimate of potential credit risk resulting from existing counterparty relationships in light of possible future risk factors such as price volatility and volume escalation.
Probability of Default (PD)	A counter-party specific estimate of the likelihood that a specific counter-party will default over a specified time horizon
TAC	Technical Advisory Committee

3. Standards

Market Credit Risk Objective

In seeking to fulfill BOD objectives to provide for a reliable Texas electricity market, ERCOT stakeholders will

- directly consider the credit implications of operational or market decisions, and
- seek to maintain a balance of identified key credit risk factors such that the combined impact of these factors yields a market-wide credit risk profile consistent with an investment grade rating

Delegation of Authority

Responsibility for monitoring and reporting on credit risk for the market consistent with this standard is hereby delegated to the Chief Executive Officer, the [Vice President – Credit and Enterprise Risk Management](#) ~~Chief Financial Officer~~ and the Treasurer. These individuals will ensure the BOD is advised of credit risk as measured by the [PCR PFE](#) Model.

This delegation does not mean that the results of any particular model analysis will be the final determination of credit risk in the ERCOT market. Such determination rests with the BOD.

Internal Control

The Treasurer will ensure that written procedures and internal controls are established over the portfolio credit risk analysis process to ensure that results are consistent with the approved process reflected in this standard.

The Treasurer will ensure that these controls are reviewed periodically by ERCOT's Internal Audit staff to monitor compliance with control procedures. The results of Internal Audit reviews as well as underlying controls may be reviewed by the Finance and Audit Committee of the BOD upon request.

In addition, the Treasurer, in cooperation with the BOD, will seek an independent review of the [PFEPQR](#) Model prior to incorporating the [PFEPQR](#) Model into any determination of collateral requirements or within one year after Nodal market implementation and at least biennially thereafter.

Measurement

ERCOT will use a standard Potential Future Exposure framework for [estimatingmeasuring](#) credit risk. The [PFEPQR](#) Model, which was built on this framework, will be maintained within this framework.

At a minimum, ERCOT's portfolio credit risk [analysis-estimation](#) for the [NodalZonal](#) market will include the following risk factor [assumptions](#):

- [Estimated](#) Probability of Default for each QSE ~~(resulting from credit score or rating)~~,
- Forward price [analysisestimation](#),
- Price volatility [analysis-estimation for both Real Time and Day Ahead Markets as appropriate](#),
- [Volume escalation behavior analysisestimation, taking into consideration both Real Time and Day Ahead Market volume activity](#)
- [Estimated value of Congestion Revenue Rights](#), and
- Simplified collateral calculations.

~~With the implementation of the Nodal market, ERCOT's portfolio credit risk analysis for the Nodal market will include the following risk factors (in addition to those outlined above):~~

- ~~• [Price volatility analysis for the Day Ahead Market,](#)~~
- ~~• [Bid and offer volume analysis in the Day Ahead Market, and](#)~~
- ~~• [Value of Congestion Revenue Rights.](#)~~

ERCOT will recommend updates of these and other risk factors if key risk factors change.

ERCOT will update model assumptions periodically with CWG input. The [Finance and Audit CommitteeBOD](#) will be informed of all model parameter changes.

At ERCOT's discretion or upon request by the BOD, TAC or CWG, ERCOT will run stress scenarios in addition to the Base Case and Current Case to quantify extreme credit risk (incorporating such things as market price events, high correlations of default, impacts of specific types of market activities and high concentration of exposures to counter-parties or types of counter-parties).

While recognizing that it is impractical to model all possible loss scenarios within the [PFEPQR](#) Model, the [PFEPQR](#) Model is a valuable tool to more effectively [monitor estimate](#) credit [risk-exposure](#) within the ERCOT market [under set assumptions](#). The model considers identified risk factors and provides an indication of potential losses; however, actual losses may be more or less than those indicated by the model.

Also, since PFE by itself does not provide a full picture of risk, ERCOT should provideutilizes other metrics to provide a broader understanding of credit risk.

It should also be recognized that multiple metrics are necessary to properly understand credit risk, so that PFE by itself does not provide a full picture of risk.

Reporting

ERCOT will maintain and run the PFEPGR Model and will prepare a summary analysis of results:

1. at least quarterly,
2. whenever ERCOT determines there have been significant changes in underlying credit risk factors-assumptions which warrant a model run, and
3. upon request of TAC or CWG when contemplating market rule changes for which significant credit implications are being evaluated.

The PFEPGR Report will, at a minimum, include:

1. the Base Case and Current Case scenarios,
2. EeExpected Loss-Loss, median loss and LlLoss DdDistributions at the 90, 95, 99 + percentiles for required and ad hoc scenarios,
3. lLarge impact stress scenarios at or above the 99th percentiles and other stress scenarios,
4. a listing of inputs used and assumptions made (specific, where possible; general when inputs are counter-party specific), and
5. ERCOT's summary analysis of the reasons for significant changes in the measurement of credit risk from the prior PCRPFEE Report.

A summary of the PFEPGR Report will be provided to the Finance and Audit Committee of the BOD, TAC and the CWG at least quarterly.

Market Credit Risk Corporate Standard Adoption

ERCOT's Market Credit Risk Corporate Standard was adopted by resolution of the BOD. The standard is reviewed at least annually by the Finance and Audit Committee and any modifications made thereto must be approved by the BOD.