Item 3: Committee Education on Market Credit

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ERCOT Public

Objectives

- Understand scope of risks that are covered by credit calculations
- Understand risks not covered
- Recognize complexity of assessing risk appetite
- Understand scope of excess collateral posted in ERCOT
- Understand estimated impact of price spikes on TPE
- Show current market activities to refine existing methodology

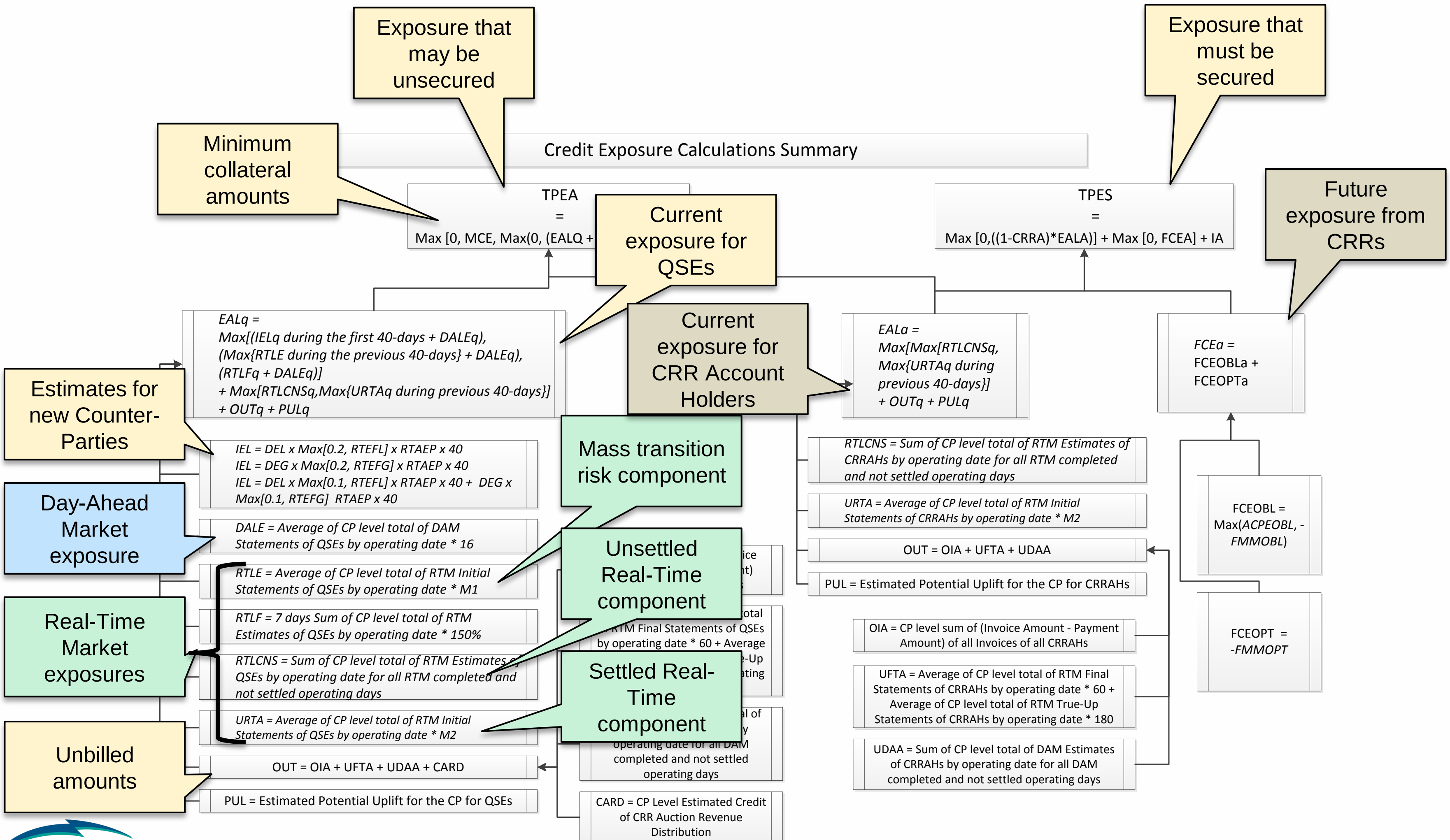
Components of Market Credit Risk

- There are a number of components to ERCOT’s market credit risk.
- ERCOT’s benchmark for quantifying credit risk is Total Potential Exposure (TPE) as defined in the Protocols.
- TPE defines exposure formulaically.
- However, TPE does not include every risk that could lead to credit losses, namely:
  - Losses arising from risks that are not addressed in TPE.
  - Intra-day tail event occurrences of risks that are addressed within TPE.

Components of Market Credit Risk

- TPE defines the minimum amount of collateral that a Counter-Party must post with ERCOT (as adjusted for allowable unsecured collateral).
- Therefore, TPE can be thought of as the amount per Counter-Party for which ERCOT is unwilling to accept losses (market uplift).
- Conversely, losses in excess of TPE can be thought of as the market's risk tolerance – potential losses that the market is willing to accept.

Risks included within the TPE calculation



A number of potential risks are <u>not</u> addressed in TPE

- Market tail events (prices and/or volumes) that create exposure in excess of the assumptions embedded in TPE.
  - The TPE impact of tail events can be estimated by stress-testing.
  - TPE may not be the appropriate mechanism to cover tail events.
- Non-market risks not addressed in TPE:
  - Individual credit quality of the Counter-Party, except to the extent that it is eligible for unsecured credit.
  - Exposure that could arise from failed bilateral contracts.
  - Insufficient Counter-Party liquidity or capital.
  - Market sector and concentration risks.
  - Market manipulation.
  - Regulatory and political risks.

Although it does not cover all potential risks, conservative assumptions are built into the TPE calculation.

- Minimum 12 days to terminate a defaulting Counter-Party. Additional days are scaled to the number of Counter-Party ESI IDs.
- Both Real-Time and Day-Ahead exposures are extrapolated over the termination days.
- Real-Time Market initial settlement days (M2) estimated at 9.
- Minimum collateral requirements applicable to all Counter-Parties.
- CRRs are collateralized based on P99 historic values.
- Real-Time Market exposure in TPE takes the highest of maximum activity over the past 40 days or 150% of Real-Time liability over the past seven days.

Tail event exposures in excess of these assumptions may result in uplift.

It should be noted that Counter-Party sectors have different risk profiles.

Category	Risk Factors	Examples
Net Generators	Short positions from unplanned outages, weather events	February 2011 events, no loss to the market
Net Load	Increased system cap, unhedged exposure to high prices and/or load, insufficient capitalization, bilateral contract exposure, no Real-Time credit constraint	Since 2011, two defaults with uplift totaling $750k
Day-Ahead / Real-Time Traders	Increased system cap, DA-RT price spreads, no Real-Time credit constraint	Since 2011 four defaults; no loss to the market
CRR Account Holders	Spread on PTP obligations	2013 West Texas congestion
All Counter-Parties	Counter-Party creditworthiness and reputation, insufficient capitalization, settlement cycle, unsecured credit, exposure calculations are backward-facing	

TPE defines credit exposure formulaically as a fixed point estimate of risk. A weakness of this approach is that there are no means to estimate just how conservative the calculation actually is – i.e., the relative risk appetite that is embedded in it.

- By way of comparison, trading desks estimate or simulate their potential range of risk outcomes, allowing “P99” estimates via Value-at-Risk methodology.

- During the zonal market ERCOT commissioned a model to simulate loss outcomes. However, upgrading the model for the nodal market was deemed too costly.

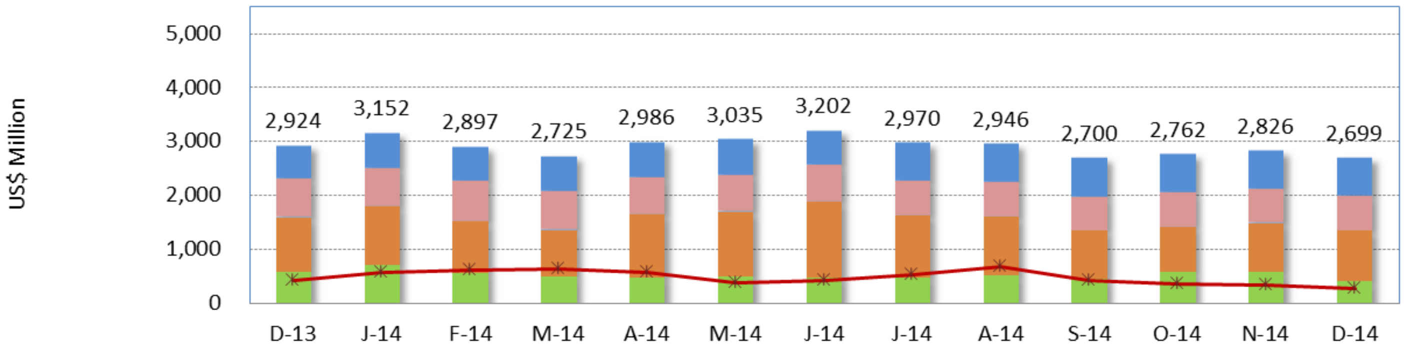
- It is conceptually difficult to translate ranges of TPE into potential uplift losses.

Historic ERCOT market uplifts.

Year	Counter-Party	Uplift ($000s)	Approx. ESIIDs
2003	Texas Commercial Energy	$ 15,000	4,900
2005/6	AZOR	$ 25	511
	USAVE	$ 210	500
	Energy West (dba Franklin Power)	$ 395	3,000
	Utility Choice	$ 5,043	12,000
	Bridgepoint	$ 145	3,900
	Subtotal	$ 5,818	19,911
2008	NPC	$ 1,537	15,163
	Highway 3	$ 1,164	12,222
	Sure	$ 1,200	6,206
	Pre-Buy	$ 168	8,779
	Leach	$ 93	-
	Subtotal	$ 4,162	42,370
2011	Abacus	$ 620	691
2012	TexRep1 LLC dba EPCOT / EPCOT LLC	$ 130	5,738
	Total	$ 25,730	73,610

TPE defines the <u>minimum</u> collateral that must be posted by a Counter-Party. The risk of credit losses in excess of TPE is further mitigated in that Counter-Parties often post collateral in excess of that required. However, this is at the option of the Counter-Party.

Credit Limit/Type of Security vs TPE

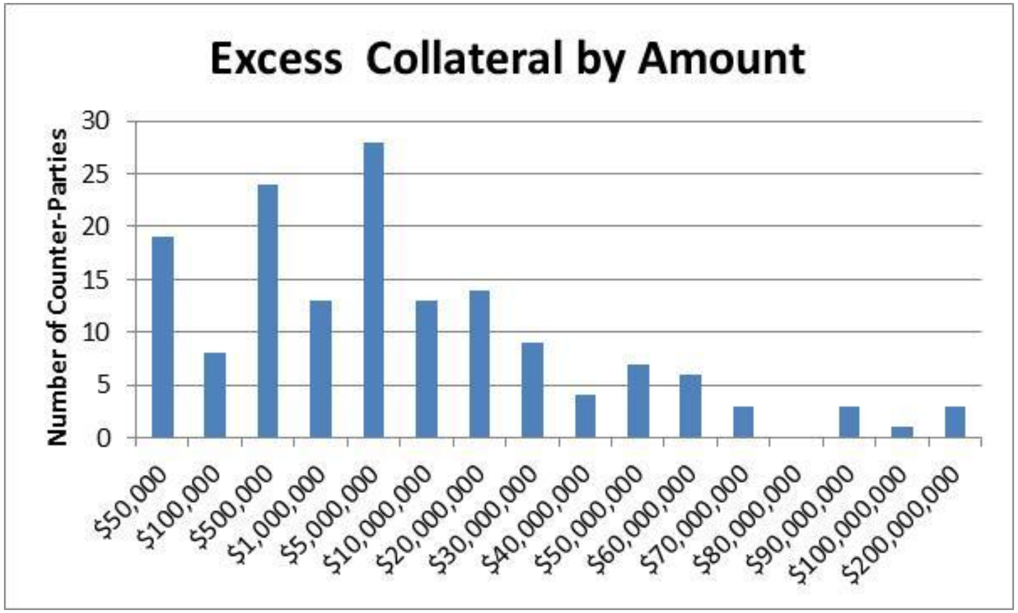


	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Total Credit Limit	2,924	3,152	2,897	2,725	2,986	3,035	3,202	2,970	2,946	2,700	2,762	2,826	2,699
Unsecured Credit	612	634	634	634	646	646	634	701	701	722	712	705	710
Guarantees	712	715	740	725	686	676	676	633	633	617	625	626	626
Surety Bonds	9	9	9	9	9	10	10	10	10	10	10	10	15
Letters of Credit	1,012	1,088	950	857	1,171	1,200	1,411	1,141	1,090	904	830	897	943
Cash	579	706	564	500	475	503	471	486	512	447	587	589	406
TPE	409	566	616	624	562	384	419	528	684	427	347	322	261

Cash Letters of Credit Surety Bonds Guarantees Unsecured Credit TPE

Size and segment composition of excess collateral as of December 31, 2014.

Excess collateral amounts range from less than $50k to greater than $100m.



Size and segment composition of excess collateral as of December 31, 2014.

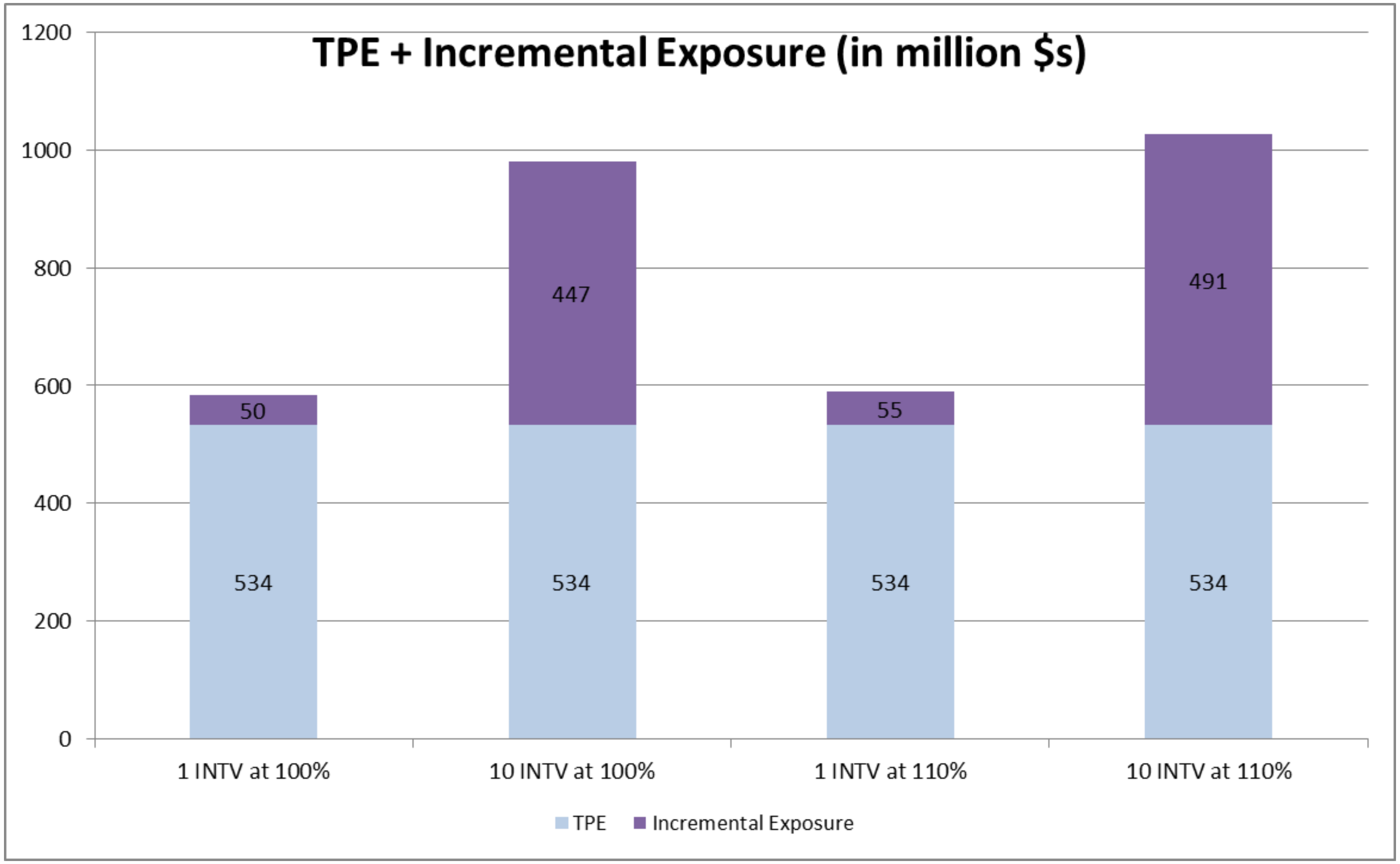
The largest average excess collateral balances were held by net load Counter-Parties.

Segment	# CPs	TPE	Excess Collateral	Average Excess	Excess/TPE
Net Generation	28	69,350,412	467,636,923	16,701,319	6.7
Net Load	61	133,633,425	1,183,424,052	19,400,394	8.9
Traders	60	57,855,463	628,295,951	10,471,599	10.9
CRR Only	6	437,015	747,588	124,598	1.7
Total	155	261,276,316	2,280,104,514	46,697,910	8.7

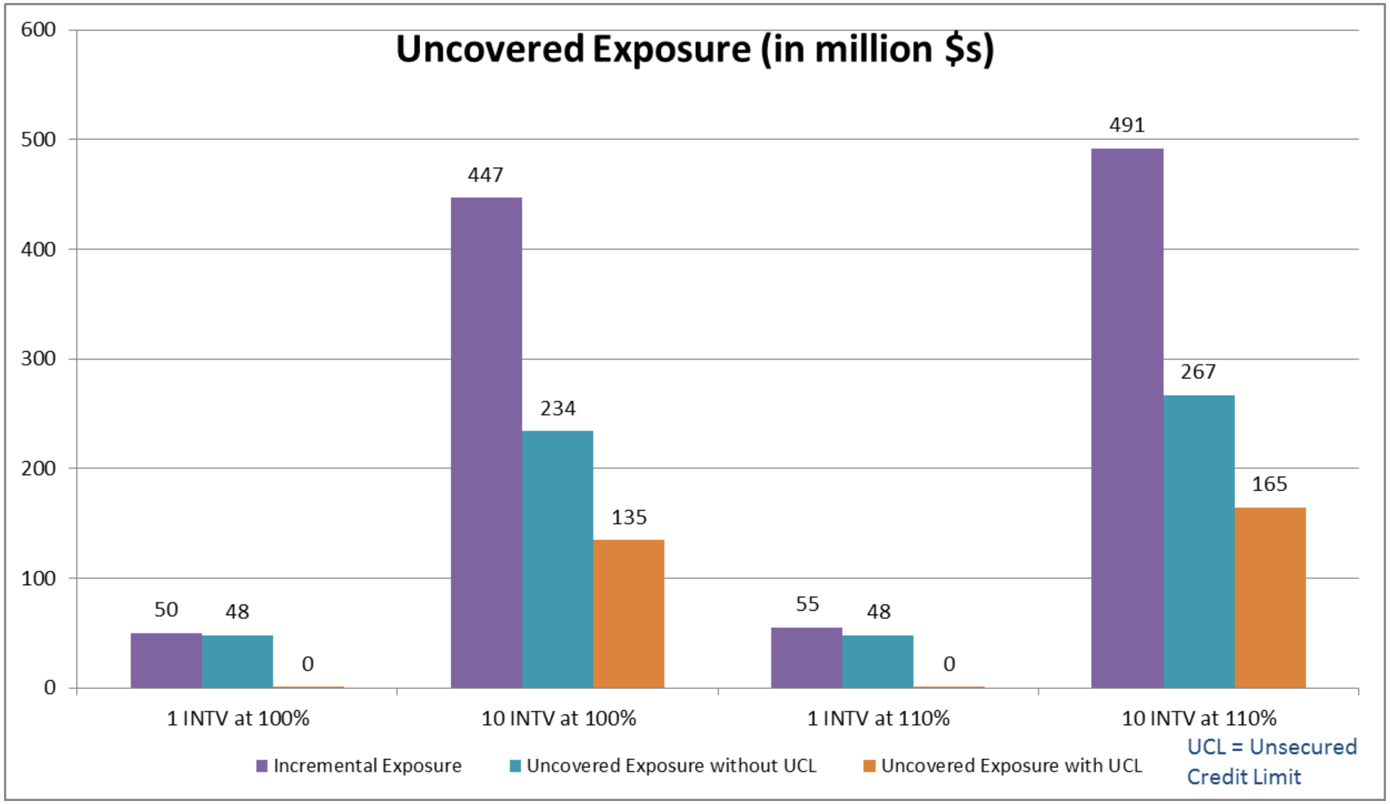
ERCOT has performed stress-testing to estimate the impact of high price intervals on TPE.

- Four scenarios tested:
  - One high price interval with no imbalance volume escalation
  - Ten high price intervals with no imbalance volume escalation
  - One high price interval with 10% imbalance volume escalation
  - Ten high price intervals with 10% imbalance volume escalation
- Stress tests based on April 10, 2014 data
- Price events begin at hour 15:15

There is potentially a large impact on TPE.



However, a large portion of the exposure was covered by excess collateral.



Ongoing initiatives

Credit Work Group (CWG)/Market Credit Working Group (MCWG) are continuing to investigate options to mitigate market risk.

- NPRR638, Revision to Certain Price Components of EAL, is under review by the market. If enacted, this NPRR would re-base Real-Time and Day-Ahead Market prices to use the P84 of historic prices looking back three years. This would better match TPE, and therefore collateral levels, with seasonal price movements.

- NPRR612, Reduction of Cure Period Subsequent to Event of Default, reduces the cure period after which termination procedures may be instituted from two days to one.

Ongoing initiatives

- CWG/MCWG are discussing how to better define market risk tolerance.
- CWG/MCWG are investigating options to cover tail risk not covered by TPE.
- ERCOT is investigating the feasibility of developing Counter-Party specific risk ratings.
- ERCOT will be discussing Seasonal Adjustment Factor options over the coming months to provide additional collateral in the summer.

Questions