Appendix A

Unsecured Credit and Unsecured Credit Limits

Supplemental Information

Purpose:

This Appendix is intended to:

* Provide a list of alternative approaches to setting credit limits (Section I)
* Describe how other ISOs set credit limits (Section II)
* Establish criteria to choose from potential options (Section III)
* Evaluate potential options against the established criteria (Section IV)
* Illustrate how the CAISO recommended approach to setting credit limits would operate. (Section V)

I. Alternatives Considered

The following alternative approaches to establishing credit limits (listed as Option A. to Option E.) can be viewed along a spectrum ranging from simple to more complex, with increasing support costs.

**Characteristics**

**Complexity Simple Complex**

### Administration Cost Low High

(A) (B) (C) (D)

# Option

**Where are the ISOs CAISO now - Ontario IMO NYISO**

**On the continuum? ERCOT**

**NE ISO**

**PJM**

**Option A: Status Quo, unlimited market credit with an Approved Credit Rating.**

The credit limit is a “binary” approach. With an Approved Credit Rating, an entity is provided unlimited credit. Without an Approved Credit Rating, no credit is extended and all obligations must be backed with collateral.

|  |  |
| --- | --- |
| **Rating** | **Credit Limit** |
| Long Term A-/A3 or Better, Short term A2/P2 or better, or State or Federal Government backed obligations | unlimited |

Option B: Tiered credit limits based on national credit rating agency (S&P / Moody’s / Fitch) ratings .

Example (indicative only):

|  |  |
| --- | --- |
| **Rating** | **Credit Limit** |
| AAA | $200 million |
| AA | $100 million |
| A | $50 million |
| BBB | $5 million |

Such an approach is limited in that it does not consider the size of an entity.

Additional simple rules could be used as well, for example, a government owned utility without a credit rating could receive $1 million in credit.

Option C: More Complex Tiered Credit Limits

Two enhancement from Option B are included here:

1. Consider entity size in the credit limit determination by including an entity’s “tangible net worth” into the calculation.
2. Consider other third party credit ratings in addition to the ratings by the national credit rating agencies (S&P / Moody’s / Fitch).

Either of those enhancements could be used independently, and other alternatives are possible. Several options were considered by the CAISO internal team, but for the sake of brevity, only the recommended option is listed here. The following discussion incorporates both of these enhancements.

Description:

A combined third-party credit rating is used to determine an allowable percentage of an entity’s net worth. A combined third-party rating[[1]](#footnote-1) would blend a rating from Moody’s/Standard & Poor’s/Fitch with another rating such as the implied rating from Moody’s KMV. Moody’s KMV maintains a proprietary scoring model that provides an alternate, potentially more timely view of the default probability of entities it rates. For example, we might use the following approach:

|  |  |  |  |
| --- | --- | --- | --- |
| **Combined Third Party Rating** | **% Tangible Net Worth** | **Tangible Net Worth (TNW)** | **Initial Unsecured Credit Limit (ICL)** |
| AAA | 7% | $W million | .07 \* W |
| AA | 5% | $X million | .05 \* X |
| A | 3% | $Y million | .03 \* Y |
| BBB | 1% | $Z million | 01 \* Z |

The resulting “Initial Unsecured Credit Limit” might be further adjusted to limit concentration of credit in the ISO market. Section V of this Appendix provides a detailed example of how this approach might be developed/utilized.

Option D: Internally conduct a full credit assessment on every scheduling coordinator to establish its credit limit, using an agreed-upon credit scoring methodology.

A credit score would be developed by assessing various measures from a financial statement review, agency credit ratings, payment history, and other factors. The measures would be assigned and weighted according to predefined standards, but might also include a subjective assessment. For example:

|  |  |  |  |
| --- | --- | --- | --- |
| **Tangible Net Worth** | **ISO Assessed Credit Score** | **Adjustment Factor** | **Credit Limit** |
| $X million | 90-100 | 100% | X \* 1.00 |
| 80-89 | 75% | X \* .75 |
| 70-79 | 50% | X \* .50 |
| 60-69 | 35% | X \* .35 |

# II. Practices at other ISOs

**Characteristics**

**Complexity Simple Complex**

### Administration Cost Low High

(A) (B) (C) (D)

# Option

**Where are the ISOs CAISO now - Ontario IMO NYISO**

**On the continuum? ERCOT**

**NE ISO**

**PJM**

***IMO*** – sets a maximum trading limit is set for each participant, and the amount of security posted is dependent on credits provided to participants. The credits are based on each participant’s credit rating, payment history and local distribution company transactions. It does not appear that IMO does any credit scoring. Credit watch warnings automatically trigger a one-category reduction in the credit rating.

* Evaluation Frequency: Each participant provides a self-assessment of credit exposure to the IMO, and the IMO compares the self-assessment amount against actual transactions. Each participant can create a new self-assessment at any time, and the IMO will conduct a participant reevaluation if the participant ever defaults on its market obligations.

***NYISO*** – uses a combination of investment grade credit ratings and credit analysis / scoring. Those participants with investment grade credit ratings are allowed unsecured credit up to a maximum of their tangible net worth. This is considered the base amount. The NYISO then conducts a credit analysis to determine the amount of adjustment that should be applied to the base unsecured credit. Those participants that receive the highest credit score are allowed 10 percent more unsecured credit, other participants either retain the base unsecured amount or are subject to a reduced unsecured amount. No participant can have unsecured credit in an amount greater than 20 percent of all outstanding market charges (considered a Market Cap). Security requests for less than $10,000 are not addressed. NYISO maintains a credit staff of 4-5 individuals.

* Evaluation Frequency: The market participant must provide year-end statements “90 days after the end of each fiscal year and shall provide quarterly statements within 60 days of the end of each quarter”.

***ERCOT*** – uses a combination of credit rating and credit scoring to develop the amount of unsecured credit. Those participants with investment grade credit ratings and minimum shareholder equity of $100,000,000 are provided unsecured credit up to a maximum amount. The actual amount of unsecured credit depends on other credit analysis conducted. Municipal utilities and other participants that do not have credit ratings are subject to credit worthiness scoring and unsecured credit is provided accordingly.

* Evaluation Frequency: further research is required to determine evaluation frequency.

***NEISO*** – uses a combination of investment grade credit ratings and credit analysis / review process. Those participants that do not have an approved credit rating or cannot prove financial viability must post security. There does not appear to be a specific set of rules on how unsecured limits are set, but their tariff does refer to satisfying NEISO’s credit review process. More research would need to be conducted.

* Evaluation Frequency: Within 10 days of NEPOOL request or upon a material change in the market participant’s financial position. Participant 8-k reports must be submitted promptly upon their issuance.

***PJM*** – bases the amount of unsecured credit on each participant’s calculated credit score and tangible net worth. Participants with investment grade long-term credit ratings are given a credit score based on the rating. Other unrated participants can submit financial information and PJM will calculate a credit score. The credit score determines the maximum percentage of the participant’s tangible net worth that is available as unsecured credit. The maximum unsecured credit that a participant can receive is $150 million. It provides for a working credit limit of 85% of the total of secured and unsecured credit (some “cushion” is required between the credit limit and obligations.)

* Evaluation Frequency: “On at least an annual basis, PJM will perform follow-up credit evaluations on all Participants / Members.”

# III. Assessment Criteria

The alternatives considered were assessed against the following criteria.

1. Initial and ongoing complexity and cost

a. Implementation / administrative complexity

b. New headcount requirement

c. Estimated implementation costs

2. Level of subjectivity / objectivity

3. Subject matter expertise required

4. Used at other ISOs?

5. Advantages compared to other methods

6. Disadvantages compared to other methods

**IV: Evaluation of Alternatives**

**Option A: Status Quo, unlimited market credit with an Approved Credit Rating.**

1. **Initial and ongoing complexity and cost** 
   1. **Implementation / administrative complexity** – none
   2. **New headcount requirement** – 0
   3. **Estimated implementation costs** – $0

**2. Level of subjectivity / objectivity –** Highly Objective

**3. Subject matter expertise required** – No

**4. Used at other ISOs?** – No

1. **Advantages compared to other methods**
   1. Objective
   2. Already implemented
2. **Disadvantages compared to other methods**
   1. Other ISOs do not allow unlimited unsecured credit
   2. Increased market risk to creditors
   3. Not considered a viable option due to potential for bankruptcy of highly rated entities
   4. Not considered an industry “best practice”

*Option B -* Tiered credit limits based on national credit rating agency (S&P / Moody’s / Fitch) ratings .

1. **Initial and ongoing complexity and cost** 
   1. **Implementation / administrative complexity** – Low, once tiers are agreed to
   2. **New headcount requirement** – 0
   3. **Estimated implementation costs** – Depends on the amount of support required to substantiate the methodology. If developed internally, the cost should be minimal. If outside help is required, the cost may be as high as $100,000.
2. **Level of subjectivity / objectivity –** Developing the tiers would besomewhat subjective, however once implemented, the method will be highly objective—no discretion or interpretation would be involved.
3. **Subject matter expertise required** – Possibly for implementation, but not for ongoing use.
4. **Used at other ISOs?** – It is implemented at other ISOs, but usually as the first step in a longer process, where other entity specific factors are considered.
5. **Advantages compared to other methods**
   1. Once implemented, establishes objective cap on unsecured amounts
   2. Relatively easy to maintain and utilize
   3. Headcount requirements remain low
   4. Moving toward a best practice solution
   5. Cost of use is low
   6. Improved credit risk management
6. **Disadvantages compared to other methods**
7. The tiers don’t consider different entity sizes and financial capacity.
8. Slow to respond to changing market conditions and credit warnings that may not be published by the rating agencies in a timely manner

Option C: More Complex Tiered Credit Limits

The recommended approach considers an entity’s “tangible net worth” and other third party credit ratings in addition to the ratings by the national credit rating agencies (S&P / Moody’s / Fitch).

1. **Initial and ongoing complexity and cost** 
   1. **Implementation / administrative complexity** – Low to moderate
   2. **New headcount requirement** – 0
   3. **Estimated implementation costs** – $50,000 - $100,000 ongoing annual cost.
2. **Level of subjectivity / objectivity –** This method could be designed with no subjectivity by the ISO, the Credit Rating will be the blended ratings from 3rd Party Rating Agencies and Moody’s KMV quantitative models
3. **Subject matter expertise required** – Yes – the ISO would hire the third party firm with expertise in this area.
4. **Used at other ISOs?** – Not as proposed here. The IMO uses Agency Ratings (unblended) and other ISOs add internal credit scoring to adjust Limits.
5. **Advantages compared to other methods**
   1. Establishes cap on unsecured amounts, based on third party assessments, and considers entity size.
   2. Relatively easy to administer
   3. No ISO headcount increase
   4. Moving toward a best practice solution
   5. Improved credit risk management by incorporating leading indicators (MKMV quantitative ratings) into the credit risk assessment
6. **Disadvantages compared to other methods**
7. Although using the MKMV quantitative rating in our final Credit Rating should provide the benefits associated with detecting credit changes early, the established limits might be more volatile.
8. MKMV ratings are not available for every participant (municipal utilities and small entities).

Option D: Internally conduct a full credit assessment on every scheduling coordinator to establish its credit limit, using an agreed-upon credit scoring methodology.

1. **Initial and ongoing complexity and cost** 
   1. **Implementation / administrative complexity** – This approach would be the most complex to implement and manage, especially if the credit assessment is conducted on every participant.
   2. **New headcount requirement** – 2-3
   3. **Estimated implementation costs** – $300,000 to $500,000
2. **Level of subjectivity / objectivity** –The degree of subjectivity / objectivity will depend on the assessment methods used, however this method would likely be the most subjective.
3. **Subject matter expertise required** – Yes-significant
4. **Used at other ISOs?** – No, though some use internal credit assessment and third party credit ratings to some degree.
5. **Advantages compared to other methods**
   1. Implements a cap on unsecured amounts
   2. Moving toward a best practice solution
   3. Improved credit risk management
6. **Disadvantages compared to other methods**
7. Higher costs and head count
8. Highest degree of subjectivity
9. Potentially complex and difficult to manage
10. Potentially less transparency to market participants.

##### V. Example of the CAISO Recommended Approach

A six step process is used to determine an entity’s unsecured credit limit:

**Step 1 –** If the participant has an Agency Rating, verify participant’s short-term or long-term credit rating with the appropriate rating agency.

**Step 2** – Obtain the participant’s Moody’s KMV default probability and the Implied Rating associated with the default probability.

**Step 3** – Calculate a Numeric Rating Score for the Agency Rating and the Moody’s KMV Rating based on Rating Equivalency Charts. Weight the numeric rating from the Agency scores and Moody’s KMV each by 50% for a Combined Numeric Rating Score.

#### **Credit Rating Agency Component**

###### IF THE ENTITY HAS A SHORT TERM RATING, USE THIS TABLE

|  |  |  |  |
| --- | --- | --- | --- |
| Short-Term Agency Ratings | | | Numeric Rating Score |
| S&P | Moody’s | Fitch |
| A-1 or higher | P-1 or higher | F-1 or higher | 2 |
| A-2 | P-2 | F-2 | 4 |
| A-3 | P-3 | F-3 | 6 |
| Lower than A-3 | Lower than P-3 | Lower than F-3 | 6 + (1 for each additional fine grade notch lower) |

**IF THE ENTITY HAS A LONG-TERM RATING, USE THIS TABLE**

|  |  |  |
| --- | --- | --- |
| Issuer Rating | | Numeric Rating Score |
| S&P, Fitch and Dominion | Moody’s |
| AA- or higher | Aa3 or higher | 1 |
| A+ | A1 | 2 |
| A | A2 | 3 |
| A- | A3 | 4 |
| BBB+ | Baa1 | 5 |
| BBB | Baa2 | 6 |
| Lower than BBB | Lower than Baa2 | 6 + (1 for each fine grade notch lower) |

If the participant has ratings from more than one agency, or both short-term and long-term ratings, a single composite numeric rating score would be calculated. For example, the participant has a Moody’s long-term rating of A2, and a Standard & Poor’s Rating of BBB+. The composite numeric score would be calculated as (2 + 5 ) / 2, or 4.

Issuer ratings would be used in this assessment. If an entity had a “senior long-term unsecured rating” instead of an issuer rating, the numeric rating score for that rating would be increased by 1 (as obligations to the ISO have a lower claim priority than senior unsecured debt).

#### **Moody’s KMV component**

|  |  |
| --- | --- |
| Moody’s KMV Rating | Numeric Rating Score |
|
|
| Aa3 or higher | 1 |
| A1 | 2 |
| A2 | 3 |
| A3 | 4 |
| Baa1 | 5 |
| Baa2 | 6 |
| Lower than Baa2 | 6 + (1 for each fine grade notch lower) |

For example, if the participant had an “A1” Moody’s KMV Rating, the Combined Numeric Rating Score would be (50%\*4)+(50%\*2)= 3.0

**Step 4** – Use the Combined Numeric Rating Score to obtain the percentage of tangible net worth to be used for the Initial Unsecured Credit Limit.[[2]](#footnote-2):

|  |  |
| --- | --- |
| Combined Numeric Rating Score | (% of Tangible Net Worth) to be used to calculate the Initial Unsecured Credit Limit |
| < 1.5 | 7.5% |
| >=1.5 and < 2.5 | 6.5% |
| >=2.5 and <3.5 | 5.0% |
| >=3.5 and < 4.5 | 4.0% |
| >=4.5 and < 5.5 | 2.5% |
| >=5.5 and <6.5 | 1.5% |
| >=7 | 0% |

In the example used thus far, a combined numeric rating score of 3 would equate to an initial credit limit of 5% of the entities net worth.

**Step 5** – Calculate the participant’s tangible net worth and initial unsecured credit limit:

|  |  |  |
| --- | --- | --- |
| 1. Allowable % of Tangible Net Worth | 2. Tangible Net Worth (TNW)  $s in (,000) | 3. Initial Unsecured Credit Limit  $s in (,000) |
| 5% | Total Assets $192,100  Total Liabilities $38,000  TNW $154,100 | $154,100 \* 5% = **$7,705** |

Tangible Net Worth (TNW) = book value of assets (excluding intangible assets such as goodwill) less book value of liabilities[[3]](#footnote-3).

**Step 6** - **OPTIONAL-** Participant A’s Final Unsecured Credit Limit = the lesser of the Initial Unsecured Credit Limit or Total ISO Accounts Receivable \* the Market Concentration Cap Limit.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 4.  Initial Credit Limit  $s in (,000) | 5.  Total ISO Accounts Receivable  $s in (,000) | 6.  Market Concentration Cap Limitation | 7.  Market Concentration Cap  $s in (,000) | 8.  Final Unsecured Credit Limit |
| $7,705 | $13,654 | 35% | $13,654 \* 35% = $4,779 | $4,779 |

1. The option described here includes the use of Moody’s KMV (MKMV) default probabilities, in conjunction with traditional Agency Ratings, to arrive at the Combined Third Party Credit Rating. Including the MKMV forward looking default probabilities will give the participants early indications of improving and deteriorating credit worthiness. The Combined Third-Party Credit Rating will be a 50%/50% weighting of the Agency Ratings (S&P/Moody’s/Fitch) with the Moody’s KMV Quantitative Rating (the rating implied by the Moody’s KMV default probability model). [↑](#footnote-ref-1)
2. Tiered charts developed from Table K-1 in Attachment K of the NY ISO’s Tariff in combination with the investment grade rating comparative analysis in the CA ISO’s Draft Credit Policy. [↑](#footnote-ref-2)
3. Tangible Net Worth definition derived from Attachment Q - “PJM Credit Policy” of PJM’s Tariff. [↑](#footnote-ref-3)