"DRAFT"

FINANCIAL TRANSMISSION RIGHTS

A DISCUSSION OF ASSORTED CREDIT ISSUES

This document is prepared in draft form for the purpose of stimulating discussion on the topic of credit policy reform specifically related to FTR credit & market risk. References to ISO positions throughout this document are made to advance the stakeholder discussion process and do not reflect the ISO's definitive stance on any particular issue. The ISO looks forward to continuing to develop its positions on the topics discussed herein by means of its continued participation in the stakeholder working group process.

PREPARED FOR:

FTR CREDIT WORKING GROUP

APRIL 25, 2008

FTR Market - Significant Challenge to ISO's Credit Policy

Brief Perspective on Credit Policy and LTTRs

In terms of Credit policy, the pending LTTR market consists of largely consistent with the existing FTR market with a few notable exceptions.[1] Not surprisingly, these exceptions pose new and unique challenges to the ISO's credit function. Chief among these concerns is the length of the LTTR obligation. LTTRs will continue to be offered as one month and one year instruments and will financially settle in the same manner as FTRs (based upon congestion cost at sink versus source). As such, the risk exposures discussed in the context of the existing FTR market, i.e., award obligation and congestion costs, similarly apply to LTTRs. However, in addition to monthly and next available year (prompt year) terms, LTTRs will also be offered through auction in four (4) additional twelve month strips (total of five (5) individual one year strips auctioned annually). Furthermore, the LTTR market introduces the new concept of allocated rights. Qualified load serving entities ("LSEs") are afforded the option to nominate LTTRs for purchase for five year terms (not to be confused with five (5) one (1) year terms) with exclusive unlimited one year renewal rights.[2] The allocation process will not require nominations to clear through an auction, rather, participants must simply meet established eligibility criteria and there must be sufficient transmission capacity available to satisfy the nomination.

Extension of the contract tenor to up to five years has a material impact on overall market default risk exposure. The most obvious example of the increased exposure, is that the longer the contractual obligation, the higher the probability of changes to the transmission system resulting in Congestion patterns materially different from those forecast at the time of initial LTTR valuation.

Default Mutualisation

While the ISO does perform as a clearing agent of sorts there is a significant difference in how the ISO serves this function as compared to most exchange based clearinghouses. Those participating in such markets enjoy the ability to perform without worry of bearing the burden of another participant's default. Under the most common form of clearing, it is the clearing organization and its partners that shoulder the burden of payment default rather than the individual investors (unless such investors are also performing a financial intermediary role as part of the clearinghouse structure). This, however, is not the case for those participating in ISO operated markets. Payment defaults by ISO participants are distributed to all (non-defaulted) market participants based upon the terms defined in the applicable tariffs.

Participants deal with counterparty default exposure on a daily basis through activity conducted outside of the ISO controlled markets. However, in most cases, the participant has the ability to assess its default exposure on an individual basis and make its credit and trading decisions accordingly. Participants in ISO administered markets, however, are exposed to counterparty risk without the benefit of vision to which of the over three-hundred ISO participants are subjecting them to the greatest level of default exposure. One of the participants' primary means of risk mitigation comes in the form of the ISO's credit policies.

It is the concept of mutualized default exposure that elevates the importance of the ISO's efforts toward shortening settlement and billing cycle times. The longer the period of estimated activity; the longer the bill cycle; the longer the payment grace period; the longer the time required suspend defaulted participants' market activity; the greater is the risk of unmitigated payment defaults. As the ISO continues

[1] This document will discuss the financial transmission rights market in terms of FTRs and will reference LTTRs specifically when necessary to draw a distinction between shorter term rights (monthly, annual) versus long-term (greater than one year).

[2] All references to LTTR Market Rules are summary in nature and are no means meant to contradict or imply different meaning from the language defined in the proposed Market Rules. Please refer to ISO-NE's Market Rules for detailed LTTR market design elements.

to shorten cycle times default exposure on materially all of ISO's supported markets has decreased. This is made true by the fact that these markets are largely physical in nature and transact in real-time, or near real time.[3] In other words, upon default, the ISO can, with few exceptions[4], curtail further losses by immediately suspending market activity thereby preventing the defaulting entity from accruing additional obligations.

FTRs as Futures Contracts

Unfortunately, FTRs present the possibility to lingering default exposure spanning from days to months in the future. This market is, by most accounts, a financial derivatives or futures markets. Futures contracts are standardised exchange traded contracts with quantity, quality, and delivery terms predefined.[5] The only parameter that is negotiated is the purchase (sale) price. FTRs, and soon LTTRs, are traded via auction; the terms of the contracts are defined in the Market Rules (e.g., delivery terms - sink/source, minimum increment, etc); and, the price is negotiated by way of the auction process.

The distinction of being analogous to a futures market itself does not convey a sense of materially elevated default exposure; in fact, as we'll discuss later in the context of bankruptcy considerations, such a designation may afford certain protections not otherwise available to the ISO. There are, however, several very important characteristics of this market that do present significant credit challenges not typically encountered by most exchange traded futures. Some of the unique challenges include:

- a comparative lack of market liquidity (largely due to the underlying FTR market fundamentals);
- the lack of frequent opportunities for trade significantly impairing the effectiveness of M-t-M margining methodologies;
- the lack of ability of the ISO to force defaulting FTR Holders to liquidate their open positions.

We will discuss how these characteristics have shaped the ISO's outlook on margining the current FTR market, and providing suggestions on how such methodologies may be improved.

Minimum Credit Requirements for FTR Market Participation

Until recently, the ISO required FTR participants to maintain a minimum of $500,000 of financial assurance ("FA") in order to participate in the FTR marketplace. This requirement was eliminated, however, with the introduction of the recent changes to ISO's FTR credit policies. Prior to the implementation of the SRFA methodology for estimating potential forward risk exposure from FTR ownership, the ISO had no means to margin against future congestion costs. Without a forward component to the FTR credit methodology, the ISO utilized a $500,000 minimum margin requirement as a proxy for potential future exposure. Creation of the forward risk component rendered the $500,000 minimum requirement unnecessary.

The ISO maintains that the use of administratively set minimum margin requirements, decoupled from estimated risk exposures, is an imperfect approach. Rather, it is believed that margin requirements should be established based upon forecasts of participant risk exposure resulting from market participation. While the ISO does not support fixed minimum margin requirements, it is interested in further exploring

[3] While the ISO does support financial transactions in the form of incremental offers and decremental bids in the energy market, these transactions have a tenor of one day and therefore don't meet the traditional test for qualifying as futures contracts.
[4] The most notable of which is the default risk of providers of last resort.
[5] Energy markets can be generally broken down into spot markets and forward markets. Transactions in the spot markets result in the exchange occurring in two days or less based upon prices established at the time of the transaction. The forward market (including futures) requires delivery (or equivalent thereof) in three days or more from the transaction date. This is what distinguishes the FTR/LTTR market from the other purely financial market supported by the ISO (virtual transactions) which occurs one day in advance of the delivery or settlement date of the transaction.

the possibility of establishing more stringent pre-qualification requirements particularly for the purpose of granting FTR market rights. Such requirements may include the establishment of trading and risk management expertise, as well as meeting certain minimum capitalization thresholds. The ISO has heard recommendations from its participants that it investigate the possibility of implementing such requirements. The most frequently discussed approach involves adopting the same (or similar) requirements as those established by the Commodity Exchange Act in the form of "Eligible Commercial Entity" status. This recommendation will be more fully fleshed-out for review by the FTR credit working group in separate discussion materials. The ISO, however, believes such recommendations hold promise and is eager to further explore the concept.

Tiered Rejection of FTRs

The ISO has fielded questions from its Stakeholders about the possibility of replacing its existing policy of rejecting all FTR bids upon failure to meet margin requirements at auction Close, to something similar to that employed in evaluating virtual transactions, i.e., tiered rejections. While this topic is certainly available for further discussion, such proposals of partial bid rejections must be structured as to avoid the unintended effect of creating more risk exposure to the defaulting entity.

FTR bid portfolios are often very carefully structured to minimize market risk exposure for the bidder. If Stakeholders were to desire the replacement of the existing "all or nothing" bid evaluation process with a tiered rejection structure, it may be best to permit participants the ability to define how their bids should be "batched" is terms of order of rejection. The use of administratively established rejection criteria may be counter productive by inadvertently creating elevated risk exposures.

Use of a bidder defined rejection hierarchy could serve the ISO's purpose of lowering overall market risk exposure, while simultaneously providing FTR bidders assurance that their most valued bids would be the least likely to be withdrawn. In that sense, such a concept could take shape in much the same form as the current Virtual bid rejection criteria where bids are "batched" according to pre-defined criteria and are removed one batch at a time until the default is "cured". In the case of FTRs, it may be possible to provide the bidder the ability to indicate to the ISO which bids are to be batched and the order which they should be removed in the event of a margin default upon bid submittal.

FTR Market Structure Dictates Credit Policy

From a credit perspective, LTTR auctions are to be structured in a similar manner as FTR auctions. The exception being that instead of conducting one annual auction, there will be five annual auctions. Each auction will be separately bid upon such that rights awarded in one year do not convey ownership in any prior or subsequent year.

Current FTR credit policy is designed in consideration of the present ISO Tariff and policies that dictate once an FTR is awarded to a participant; such obligation remains the responsibility of that entity for the life of the contract. Therefore, if an FTR holder defaults on its payment obligations and is subsequently suspended from the markets, the participant remains responsible for all future settlement obligations accrued to its FTR portfolio. The likelihood of full recovery of such future payment obligations from the defaulted party is low thereby exposing participants to the prospect of a string of continuous payment default allocations throughout the remaining term of the FTRs. Therefore, the current BidFA, AwardFA, and SRFA methodologies all suppose an exposure window equal to the length of the FTR in question (one month for short-term, twelve months for annual). The presumption of FTR ownership for life is supported by the dynamics of the FTR market itself.

- First, the shortest FTR duration is one month. Therefore, upon award of a monthly FTR the ISO does not provide a practical way to liquidate the position.[6]
- Second, other than through the annual auction, held once per year, the ISO does not provide for the auctioning of FTRs for months beyond the prompt month. Therefore, owners of annual FTRs are not provided a mechanism by which they may expeditiously close their forward positions. While holders of Annual FTRs may offer their positions for sale in the individual monthly auctions, the prompt month plus (x) forward exposure remains until such time as all of the monthly positions are successfully liquidated (approximately one month prior to the end of the original FTR term). Furthermore, there is no assurance that the defaulting party will be successful in liquidating the FTR book, similarly, as the market continues to revalue congestion, there is a risk that the market value of the FTRs may continue to fall further increasing the default exposure.
- Third, while it is possible to conduct trades via the ISO supported secondary market, there have been precious few trades conducted in this market. Moreover, the ISO secondary market provides limited functionality. One such limitation is that only FTRs for the pending prompt month may be entered into the system. This limitation effectively eliminates the secondary market as a means for closing-out a defaulting FTR holder's long-term portfolio.

It is on this foundation that the current FTR FA requirements are designed. It is incumbent upon the ISO and its stakeholders to explore every available option (credit and non-credit) in an effort to mitigate FTR default exposure.

ISO Rights to Liquidate Defaulted Portfolio

In order to contemplate viable options for enhancing the existing FTR credit policy an assumption must be made that changes to appropriate tariffs[7] will be made to permit the ISO to take certain protective actions in the event an FTR holder fails to cure a default. Such amendments should define the ISO's right to cause a defaulting participant's FTR portfolio (all or in part) to be offered for sale (liquidation). Currently, such custodial rights are not afforded to the ISO. It is essential that the ISO be unencumbered in responding to certain clearly defined default conditions incurred by an FTR holder. Given the lengthy delay between auctions, the ISO must be able to act expeditiously to enact whatever means made available to minimize the Pool's exposure to a defaulting FTR holder.

Consideration should be given as to whether separate liquidation triggers should be established based upon type of default. In other words, a margin default may merit different treatment than other forms of default under the financial assurance policy or the billing policy. If, however, events transpire meriting the liquidation of the defaulted participant's FTRs, liquidation may include the ability to enforce any number of the following until such time as the default has been cured (or in the case of terminated participants the FTR portfolio has been effectively liquidated):[8]

- Prior to the next scheduled auction, require defaulting LTTR holder to post its outstanding portfolio to the ISO supported secondary market (at pro rated initial purchase price; at a predetermined discount to purchase price;

[6] FTR holders may liquidate their position bilaterally or through the ISO supported secondary market. However, the ISO limits such transactions such that the minimum term is a complete month. Therefore, the only way a monthly FTR position could be closed is if it were sold via the secondary market after the completion of the auction but prior to the start of the following month. This equates to a window of just over one week.

[7] At a minimum this would include the ISO's financial assurance policies.

[8] Of course, if any such liquidation scenario includes the option to sell the defaulted portfolio in part, any offsetting transactions would be considered closed and would be retained by the defaulted entity. This would ensure that offsetting transactions would not be split thus increasing settlement exposure.

- Offer portfolio for sale in each subsequent ISO administered auction (at the original purchase prise; at a predefined discount; as a pure price taker; etc)
- Conduct a special auction for the sole purpose of liquidating the defaulted entities portfolio (most likely as a total portfolio in order to avoid "cherry-picking" profitable paths)

Such rights should specify the initial steps to be taken by the ISO as supported by its stakeholders in order to minimize the default exposure. The ISO would want to have the specific course of action clearly defined in order to maintain as much transparency to the process as possible for the benefit of prospective FTR participants and non-FTR participants alike.

Bankruptcy Consideration for FTR Ownership

The single largest challenge posed by the FTR market for both market participants as well as the ISO credit policy is the spectre of an unsystemic change to the transmission system resulting in a significant shift of congestion patterns. While temporary conditions resulting in uncommon congestion patterns do pose a risk to the financial returns of FTR holders, the loss exposure is, by its nature, transient. Occurrences of unsystemic shifts in congestion patterns, however, represent the largest threat of extended periods of financial exposure to holders of FTR. While such risk exists in the present FTR market, the exposure will significantly increase upon introduction of the LTTR market.

As discussed above, the first step toward supplying the ISO with the necessary tools to assist in curtailing extended periods of FTR default exposure is to assign certain liquidation rights to the ISO. While it may be decided through the stakeholder process to supply such rights through policy amendments, a declaration of bankruptcy by a defaulting FTR holder may materially impact the enforceability of such rights. While ISOs operate as clearing agents for those transacting in their markets, it can be argued that other than the application of net settlement billing, ISO's (more specifically those participating in ISO's markets) have not been provided a similar degree of bankruptcy protection as extended to organizations qualifying as clearinghouses, forward contract merchants or financial institutions as defined within U.S. Bankruptcy Code.[9] To summarize the concern as it relates to the FTR market, there is a risk that once a defaulting FTR holder files for bankruptcy protection, the courts may choose to enforce stay protections upon all collateral posted by the participant prior to the filing. Regardless of the ISO's ability to collect margin for post-petition activities, if pre-petition margin is rendered unavailable to cover prospective losses from the existing FTR portfolio, the ISO and its stakeholders may be faced with considerable bankruptcy default exposure.[10] Furthermore, if bankruptcy protection negates the ISO's rights to take action toward closing a defaulting FTR holder's portfolio, the exposures warranting the provision of such liquidation right will remain.

Fortunately, the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act ("BAPCPA") served to extend the bankruptcy code's protections for the financial services industry to include a broader array of financial contracts. The BAPCPA also broadened the eligibility criteria for designation as a financial contract counterparty in the financial services industry; possibly permitting the ISO to qualify for certain protections from bankruptcy imposed stay provisions. While extensive legal review has yet to be conducted on this topic, preliminary review suggests that the ISO may be well positioned to benefit from such protections as it relates to its administration of the FTR market.

[9] Issues pertaining Bankruptcy Law are complex in nature and call for extensive legal review, research, and discussion. This paper will refrain from such forensics and instead aims to highlight the bankruptcy issues that ought to be further explored.

[10] It has been the ISO's experience that while pre-petition collateral has been subject to bankruptcy stay protection, funds have eventually been made available to the ISO at a later date. This experience, however, does not preclude the possibility of less than one-hundred percent of pre-petition collateral being released to the ISO as a result of bankruptcy court proceedings.

If the FTR market does not qualify as a futures market, or, if the ISO itself does not qualify for protections under the BAPCPA, the ISO and its stakeholders must recognize the very real spectre of bankruptcy exposure and accommodate this risk factor into its FTR margining methodology. On the other hand, if the ISO qualifies for such protections, it would clear the way for greater use of common margining methodologies used by financial markets worldwide for addressing default risk on exchange traded futures contracts.

Credit Insurance and the Question of Illiquid Collateral for Margining FTR Activity

There is an opinion that suggests that, due to the uncertainty created by the bankruptcy process, participants may actually face greater payment default exposure from those posting cash margin as compared to those that utilize credit limits, or, to a lesser extent, affiliate guaranties. While the ISO does not share this sentiment, such an assertion is largely founded upon confidence in the ISO's credit insurance backstop. Simply put, the ISO maintains a credit insurance policy that backs the payment obligations by those market participants qualifying for such free credit under the terms of the FAP. The policy insures the ISO, and its participants, against payment defaults incurred by credit limit participants. The insurance covers all such obligations that accrued while the participant was listed on the policy.[11] While the policy covers up to $80 million per year in such payment defaults, collection of such claims will be delayed thereby imposing certain liquidity risk, and carrying costs, to the non-defaulting participants.

As far as affiliate guaranties, protection rests on the argument that defaults, and, or, bankruptcy proceedings, of the participant do not necessarily signify that the participant's guarantor is similarly distressed. The ISO and its stakeholders recognize this as a somewhat specious assertion and therefore treat affiliate guaranties as the least secure form of financial assurance made available for use by its participants.

Whether, or not, one is supportive of the ISO permitting eligible participants the use of credit limits and affiliate guaranties for meeting their margin requirements for physical market participation, the ISO urges its stakeholders to reassess such permissions when considering obligations resulting from FTR market activity. ISO's credit policy relies, almost exclusively, upon the credit ratings agencies in determining the eligibility for, and magnitude of, the extension of free credit.[12] While the existence of credit limits and affiliate guaranties does result in elevated levels of uncollateralized default exposure, stakeholders have chosen to embrace this risk by maintaining their availability. Admittedly, such default risk associated with physical market participation has been appreciably reduced; however, do stakeholders believe it reasonable to continue to place such faith in credit ratings and tangible net worth calculations for the purpose of permitting free credit to cover estimated obligations in a futures market that spans months, if not years into the future?

The ISO is unaware of any example where participants engaged in the trade of exchange managed futures contracts are permitted to meet margin requirements through the use of non-liquid forms of financial assurance. Among other reasons why credit limits and parental guaranties are not permitted to margin futures contracts, is the utter lack of bankruptcy protection and the inability to immediately call upon the collateral in the event of default.

Furthermore, if it is determined that the FTR market is to be considered a futures market the protections afforded by the credit insurance policy may be jeopardized. While further research must be conducted,

[11] It is important to repeat that the Policy only covers obligations accrued while the Participant is listed on the Policy. Any future obligations (i.e., future congestion costs) would not likely be covered. Details pertaining the ISO's Credit Insurance Policy are located in the ISO's Financial Assurance Policy for Market Participants. Further information can be provided by the ISO upon request.

[12] Ratings agencies used to establish credit and guaranty limits include Standard & Poors, Moody's and Fitch.

there is a question as to whether the existing credit insurance policy would cover payment defaults related to futures market obligations. If this stands true there may be a significant risk that, at minimum, modifications must be made to the existing credit insurance policy likely resulting in significantly larger premiums. At worst, the ISO may not be able to secure credit insurance coverage for its participants operating in the FTR marketplace thereby eliminating the insurance backstop.

In consideration of the above, the ISO would like to explore stakeholders' appetite toward altering the FAP to require only liquid forms of collateral (i.e., cash, letter of credit, treasuries) be posted for purposes of margining FTR market participation. The ISO is not asking its stakeholders to entertain the complete removal of credit limits and affiliate guaranties; only that these forms of financial assurance not be permitted for use in meeting FTR margin requirements. It is expected that credit limits and affiliate guaranties would continue to be allowed as financial assurance for all other market activity.

General Discussion of Initial Margin for FTRs

Much time has been devoted discussing the treatment of FTRs as futures contracts and there are numerous references to the ISO serving the function of a clearinghouse providing an exchange based method (auction) to award such contracts. Such discussions signal the ISO's desire to explore the possibility of borrowing heavily from margining techniques presently employed by futures exchanges. While such techniques as initial margin, M-t-M, maintenance margin, and the like are universally embraced for the purpose of margining futures markets, the FTR market presents a number of constraints that may limit the ability of the ISO to utilize such standard risk techniques. Some of these limitations include:

- Limited market participation – on average, approximately 40 Participants per month are awarded monthly FTRs, fewer participate in annual FTR auctions.[13]
- Disproportionate number of available contracts (FTR paths) – the large number of available paths, upwards of one million, results in a significant number of available contracts with little to no market activity.
- Illiquid secondary market – there has been effectively no activity on the ISO supported secondary market, and it appears there has only been limited bilateral activity outside of the ISO's systems.
- Infrequent auctions / lack of balance of planning period auctions – Until such auctions are implemented there remains no means to accurately assess M-t-M valuations for FTR participants holding annual rights.[14]

At the risk of over simplifying, traditional futures margining techniques involve the establishment of initial margin followed by M-t-M settlement adjustments to the initial margin balance. If the margin balance falls below a pre-determined threshold (maintenance margin) a margin call is placed demanding additional margin be deposited on account (variance margin). Additionally, there are a number of techniques employed to further adjust margin requirements as the contract nears its final trade date.

In many ways the ISO currently employs variants of these techniques in margining its markets. Initial margin is generally intended to represent the maximum loss that could be incurred before the exchange could close-out all of the defaulting party's open positions. This exposure is usually calculated utilizing a

[13] Furthermore, a large percentage of the FTR holders are LSEs that are likely to participate in LTTR Allocations further diminishing the pool of likely LTTR auction participants.

[14] Balance of planning period auctions have been employed at PJM since 2006. Reference to this type of forward auction methodology does not imply that such an auction method is optimal for the ISO or its stakeholders; it is used merely to illustrate the availability of alternate auction models.

99% confidence interval assuming a one-day loss exposure. The following is a brief review of the various FTR instruments in the context of initial margin.

Monthly FTRs[15]

These rights are auctioned in individual months just prior to the beginning of their term. As such, there are limited options to liquidate a monthly FTRs, furthermore, there is no mechanism in place (nor contemplated for the LTTR market) that would allow the liquidation of such a short term instrument once the auction month has commenced. In short, there is no formal means by which the ISO can close-out a monthly FTR once awarded. Therefore, initial margin for monthly FTRs can be assumed to amount to the auction price of the FTR (Bid FA / Award FA) plus the maximum plausible loss, given a defined confidence interval, in congestion revenues that could be sustained throughout the term of the contract (SRFA).

Annual FTRs / Annual LTTRs (prompt year)

As is the case for monthly FTRs, the ISO has no mechanism to effectively liquidate the open position of defaulting FTR holders possessing annual rights for the current year. Without the existence of additional auctions that include months beyond the prompt month, there is no standard means by which the ISO can promptly effect the liquidation of a defaulted portfolio of current year annual FTRs. Assuming the provision of liquidation rights, the ISO will be able to force the liquidation of the portfolio in each of the remaining monthly auctions. However, this would likely provide little relief as each subsequent auction would be expected to result in the revaluation of the portfolio, in effect, locking-in the prevailing market losses over time. The benefit afforded by immediacy of position liquidation is the mitigation of market risk. In other words, the avoidance of worsening FTR market conditions resulting in increased loss exposure. Monthly liquidation would not convey such benefits.

Upon the introduction of the LTTR market, the ISO is planning on modifying the structure of its current FTR secondary market. One of the changes being contemplated involves the easing of the LTTR term limitations for posted transactions. In other words, as long as the LTTR being offered for sale (or purchase) has a start date of the beginning of a month, and an end date of the end of a month, such posting will be permitted.[16] While such changes open up the secondary market as a potential vehicle for liquidating extended rights, it should be considered of very limited value until such time as it gains traction in the marketplace.

In terms of establishing initial margin requirements for consideration of annual FTRs and prompt year annual LTTRs, it may be most appropriate to assume, similar to monthly FTRs, that there is no opportunity to efficiently effectuate portfolio liquidation. If this holds true, default exposure should amount to the auction price of the FTR plus the maximum plausible loss, given a defined confidence interval, in congestion revenues that could be sustained throughout the term of the contract.

[15] In actuality, there will be two types of LTTRs – Long Term LTTRs (one year terms) and Short Term LTTRs (one month terms); however I will refer to long-term rights as "annual", and short-term as "monthly".

[16] This is meant only as a simplified summary, the final terms pertaining the posting of LTTR secondary market will be outlined in LTTR training materials and manuals at a later date.

While the current FTR credit policy reflects the basic principals of initial margin, there are opportunities to improve upon the design. Some suggested enhancements include:

- Contemplate incorporating seasonality effects in determining margin requirements
- More appropriate consideration of the portfolio effect on risk exposure
- Use of probabilistic approach to estimate potential losses
- Use of M-t-M or mark-to-model principals to adjust margin requirements for prompt year positions

Seasonality Adjustments to FTR Margin Requirements

When designing the current FTR margin methodology a number of stakeholders expressed interest in exploring the option to integrate a seasonality component into the calculation of FTR requirements. At the time, the ISO expressed its concern that the historical data set may be too limited to permit the creation of a methodology that would provide meaningful results. Furthermore, the ISO expressed concerns about deriving a methodology robust enough to produce meaningful seasonally adjusted risk exposures without the use of more rigorous statistical techniques than was being supported at the time.

The present SRFA proxy methodology utilizes the most recent three years of monthly FTR returns to create a proxy value for an FTR path. One of several limitations associated with this approach is that it disregards the seasonal nature of congestion in forecasting monthly FTR risk. For example, the SRFA requirement for a counterflow FTR on a path that only exhibits congestion during the summer months will largely be the same whether purchased for January or August. Similarly, annual FTRs have an SRFA requirement calculated at the time of the initial auction with such requirement depreciating in a straight line fashion throughout the term of the FTR without regard to the seasonal returns, and exposures, of the contract.

One comparatively simple method to help alleviate the seasonality concern is to designate each month as being either a summer month or winter month.[17] This approach would permit the creation of separate summer / winter SRFA proxy values based upon actual historical average monthly congestion costs over an extended look-back period (4 or more years). These seasonal SRFA values could be applied for bids in the monthly auction as well the annual instruments. Application for the monthly FTRs would be straightforward, annual FTRs could be subject to a blend of the summer and winter SRFA proxy values based upon the remaining term of the instrument. At the point of initial auction, the FTR would be subject to (x) months of winter SRFA proxies, plus (y) months of summer proxies. As the FTR plays out, the most recently completed month (whether summer of winter) would fall off of the FTR holder's SRFA requirements calculation.

This discussion of seasonality is presented in the context of the existing methodology for estimating forward risk. However, it may be appropriate to evaluate the feasibility of applying a more probabilistic approach toward the estimation of forward exposure. In other words, move away from selecting a proxy value from a discrete set of observed historical returns, i.e., the ninth worst monthly return over the prior thirty-six months) and, instead, employ a probabilistic approach toward estimations in concert with the use of enhanced portfolio margining techniques.

[17] The exact designation of which months are summer versus winter as well as whether a shoulder period should be introduced merits further discussion.

Enhanced Utilization of Portfolio Margining Techniques

Presently, the ISO evaluates each FTR individually in terms of assessing the maximum implied loss exposure (SRFA) over its term. Such exposure is estimated by creating a proxy price based upon the monthly congestion cost returns experienced on the applicable path for the applicable period (on-peak or off-peak) during each of the last thirty-six months.[18] For annual FTRs, the calculated proxy price is approximately the ninth worst observed monthly congestion return (75% confidence interval for thirty-six month historical data set).[19] The proxy represents the expected forward congestion cost risk exposure for the FTR path. A separate proxy is created for each FTR path bid upon in the auction.[20] Participants' SRFA margin requirements are determined by summing each of these individual path specific requirements.

The ISO's application of portfolio offset rights in calculating FTR auction margin requirements is limited in nature. Margin offsets occur when a *cleared* negative bid (negative Award FA) is larger (in absolute terms) than the calculated SRFA value. In other words, the amount the participant is due to be paid through the auction is greater than the forecasted potential cost of FTR ownership. Individual FTR Award FA credits are permitted to offset other FTRs (for that auction) that have Award FA margin obligations thereby lowering total portfolio margin requirements.[21] However, if the congestion cost proxy is a credit, i.e., congestion costs are forecast to accrue to the benefit of the FTR holder, the ISO sets the SRFA value to zero. The ISO adopted this approach in an effort to limit the extension of margin "credit" based upon forecasted congestion returns. As the SRFA methodology was new to the ISO and its stakeholders, the parties felt it appropriate to initially lean toward this conservative approach.

A principal opportunity for improvement to the existing methodology relates to the ISO's calculation of individual SRFA values in isolation of the FTR holder's overall portfolio. By summing the maximum plausible loss exposures for each individual FTR, the current approach disregards consideration of the effect of diversification on the risk characteristics of a portfolio of assets. A preferred approach would assess the net credit risk posed by the entire portfolio of positions taken as a whole. The premise relies upon the assumption that the assets in the portfolio, in this case FTR paths, are not perfectly correlated. If true, overall portfolio risk is decidedly lower than that exhibited by the sum of the individual paths.[22] In practice this would suggest that a better approach would involve measuring the expected loss of the entire portfolio at a predetermined confidence interval, rather than simply summing the risk exposure of each of the individual paths.

Proper application of such a technique would require the ISO to incorporate all overlapping positions of the FTR holder in order to make full use of the methodology. This implies that each evaluation of awarded rights would require review of all open positions including monthly and annual FTRs as well as transactions conducted on the ISO's secondary market. Each time an FTR holder purchases or sells an FTR, regardless of which ISO supported venue the transaction is conducted, the entire portfolio should be re-valued based upon the risk characteristics of the new

[18] The last month included in the data set is that which represents the most recently completed month prior to commencement of the auction.
[19] For details pertaining the existing calculation methodology employed by the ISO in establishing FTR credit requirements please refer to financial assurance training supplied on the ISO Website.
[20] The ISO calculates a separate proxy for on-peak FTRs and off-peak FTRs.
[21] If a participant's total monthly FTR auction Award FA plus associated SRFA requirements sum to a negative value, the net credit is permitted to offset the participant's other margin requirements. Annual FTRs are treated differently. Net negative annual Award FA values are scaled down such that only one month's worth of the total margin credit is permitted.
[22] Of course, the risk exposure resulting from a truly undiversified FTR portfolio where all paths share similar sink/source geography and congestion characteristics may, in fact, reflect the sum of the individual path risks.

mix of contracts. Similarly, the ISO must also recognize when an FTR holder conducts a trade in an effort to offset, or close-out an open position. At first glance, such a transaction would appear to lower forward risk exposure; however, this may not always be the case. For example, if the open position is performing as a hedge against other high risk FTRs in the participant's portfolio, closing-out the open position may serve to increase forward risk exposure.

While the ISO supports the use of such portfolio margining techniques it should be noted that it is only feasible to utilize such a methodology after the auctioned FTRs have been awarded. The concern here is similar to that faced when evaluating the potential award obligation of an FTR bid. That is, the ISO must be sure that, whatever methodology is employed, the FTR credit policy is not be subject to gaming.[23] If provided the opportunity to artificially lower pre-auction margin requirements, participants may employ such strategies in an effort bid in excess of there margin facilities. FTR bidders could layer their bidding portfolio with supplemental bids on paths meant to neutralize the risk exposure of the overall portfolio. If these bids do not clear in the auction, perhaps by design, the resultant award portfolio could represent an elevated risk exposure possibly resulting in a post-auction margin call. Such actions could result in FTR ownership by immediately defaulting participants. The use of portfolio methodologies for establishing pre-award margin requirements would introduce such a risk. Therefore, the ISO recommends the use of portfolio margining when evaluating the forward congestion cost risk of an *awarded* portfolio; however, it will be necessary to utilize an alternate methodology when evaluating such risks prior to running of the auction.[24]

M-t-M

SRFA margin requirements for annual FTRs are currently calculated upon auction close and then later at auction clearing. Once the post-auction requirement is calculated the SRFA component only changes as a result of the reduction in the number of unsettled days remaining in the term of the FTR. Changes to the market value of the annual FTR experienced throughout the FTR term are *not* currently reflected in the long-term FTR holder's SRFA margin requirement. The clearing of monthly auctions provides a valuable forecast of the market's expectations of the short-term (next month) congestion cost exposure associated with the annual FTR portfolio. In designing the current SRFA calculation, consideration was given toward creating a methodology that involved periodically remarking the SRFA requirements for annual FTRs. However, in order to minimize the frequency of shifts in margin requirement for long-term FTR participants, as well as the desire to minimize the complexity of the calculation of FTR margin requirements, it was decided to postpone the implementation of such an approach until a later date.

In consideration of recent FTR payment default events outside of the ISO's market, and the pending introduction of the LTTR market, the ISO would like to revisit the use of M-t-M margin adjustments for long-term FTRs. The ISO believes it important to utilize current market conditions and expectations in order to periodically revise the forecast of expected risk associated with the remaining term of annual FTRs. Unfortunately, proper use of M-t-M is not possible under the present FTR market design. The most basic definition of M-t-M is the assigning of a value for a contract based upon the prevailing market price for that contract. There is no means to assess

[23] Bidding behavior designed for the purpose of artificially lowering margin requirements below that necessary to meet the accepted risk thresholds as defined in the financial assurance policy as agreed to by the ISO and its stakeholders.
[24] Portfolio margining should be used any time that the transaction is assured, for example, in evaluating secondary market trades, or the transfer of allocated rights in the pending LTTR market.

what the market price is of a contract that is not being freely traded, and other than the prompt month of an annual FTR, the ISO does not provide a means for the forward months of an annual FTR to be traded.

Mark-to-Model

There are methods used to estimate values for contracts that do not actively trade thereby conveying no reliable market price information – collateralized debt obligations come to mind. Such methods include establishing valuations based upon the comparison of correlated assets, or, the use mark-to-model techniques. There are no forward traded products comparable to FTRs and therefore no opportunity to mark to alternate asset prices. There may be room to debate the effectiveness of the mark-to-model approach; however, margin calls placed *after the annual FTRs are purchased* may be of limited value due to the inability of the ISO to liquidate forward positions. Therefore, mark-to-model margining may be best applied as a supplement to the initial margin methodology when evaluating bids for the annual, and to a lesser extent, monthly auctions. For instance, rather than create a model to estimate expected nodal congestion costs and, therefore, expected FTR returns. The model could be used to create several pre-defined stress-test scenarios as an alternate means to estimate the risk adjusted potential loss of an FTR portfolio. These results could be used in concert with the initial margin requirements to establish a more robust margin requirement based upon a historical analysis as well as a mark-to-model forward forecast of potential loss.

Further discussion must take place at the stakeholder level to assess the desire to utilize a forward model in establishing FTR margin requirements. If such a model were employed, scenarios would be developed with extensive stakeholder input, all model input data and assumptions would be made public consistent with the current posting of the FTR model assumptions, and any data shared from the running of the model must be shared in a public manner. Furthermore, the ISO would work closely with its participants to insure that all necessary precautions were take to make certain that model results would not provide valuable pricing signals to the marketplace, including to any participant that may receive a margin call resulting from the application of the model. The intent of any such tool would be to determine the maximum plausible default exposure represented by a participant's total portfolio of FTR contracts based upon stress-test scenario analysis. The results would be portfolio based and reflective of worst-case outcomes.

While there may be room for debate about the effectiveness of a mark-to-model approach in the traditional sense (i.e., as a proxy for M-t-M valuations) alternate applications of the approach may prove very valuable in assisting in the mitigation of FTR default risk.

Do Allocated Rights Merit Lower Credit Requirements than auctioned Rights?

This issue is discussed in relation to the alternate market structure to be employed for auctioned versus allocated LTTRs; however, the general topic may bear relevance to margin considerations and qualification requirements for the FTR market.

Many FTR participants utilize the current FTR market as one of the prongs in a larger hedging strategy. A properly hedged portfolio rewards the FTR holder with the assurance that regardless of the magnitude, or direction of congestion, the participant will not experience a material adverse financial exposure. In other words, FTR losses would be equally offset by revenue accretion elsewhere in the value chain.

Unfortunately, the ISO currently has no means to accurately assess the presence and strength of such hedging strategies, and, therefore, has treated all FTR activity, and FTR participants, alike in terms of FTR margin requirements. With the pending introduction of allocated LTTRs, however, market rules have been crafted defining specific eligibility criteria for participation; including, the requirement that allocated LTTR holders must have load serving obligations at the sink zone at least equivalent, in MWs, to the nominated LTTR MWs. In addition, the LSE must attest to holding a valid contract (or ownership stake) with a generator at the LTTR source – this too must be greater than or equal to the size of the LTTR nomination. While by no means a stringent test of the purity of the LTTR hedge, this validation process conveys a sense that the default risk associated with allocated LTTRs may be lower than that of auctioned LTTRs.

Furthermore, as a result of the process by which auction revenue rights are distributed, LSEs (those most likely to be eligible for LTTR allocations) are benefited through a congestion cost reimbursement in the form of auction revenue rights payments. While these payments are not guaranteed, and are even less tightly linked to actual congestion costs experienced by the allocated LTTR Holder, they do represent a certain financial damper against increased congestion costs.

Consistent with the goal of creating margin calculations commensurate with risk exposure, and in consideration of the above, there may be room for discussing the merits of assessing lower credit requirements for allocated LTTR rights than those for auctioned rights. While it is certainly possible that LTTRs attained through auction, or the ISO supported secondary market, may represent legitimate hedging opportunities, the ISO does not have the means to confirm the validity of each position individually.[25] As such, any discussion of reduced LTTR credit requirements should only be considered in the context of allocated rights.

There are a number of factors to consider when contemplating the hedging characteristics of allocated LTTRs and the validity of extending lower margin requirements. Chief among these is the concern that, unless both halves of the hedged instrument settle through the ISO's systems, there remains a default exposure. In other words, even if the hedge is perfectly constructed resulting in revenue gain equal to the level of LTTR loss, if that increased revenue is not settled on the ISO's systems, that participant would be subject to increased LTTR obligations (i.e., larger bill) thereby constituting a larger default risk. Furthermore, the ISO will not be validating the terms of the contracts submitted by LSEs' in support of their allocation requests. Therefore, there is no assurance as to the quality of the hedge as the pricing terms of the contract may result in a disconnect such that there may be limited protection against net losses due to unanticipated congestion conditions.

[25] Unlike those attained through the Allocation process.