

Seams Issues - High Priority Items

Rank	Business Practice Inventory Item	IMO (Based on Anticipated Rules at Market Startup)	ISO-NE	NYISO	PJM	Characteristics of preferred practice
1	<div>Transaction Check-Out</div> <div><div>How often and when</div><div>Schedule changes due to failure</div></div>	<div>Day-Ahead: Check-out timeframe to be determined. IMO will perform an advisory check-out based on the pre-dispatch schedules. Because the pre-dispatch is non-binding, the IMO will not adjust schedules for check-out failures.</div> <div>In-Day Hourly: Check-out performed between 40 minutes to the hour and the start of the hour.</div> <div>Notification Method: by phone</div>	<div>Day-Ahead: Check-out performed after 12:00. Failed transactions are not included in the day-ahead unit commitment.</div> <div>Corrections to NERC tags can be submitted before 14:00.</div> <div>In-Day Hourly: Check-out performed between 30 minutes to the hour and start of the hour.</div> <div>Notification Method: by phone</div>	<div>Day-Ahead: All transaction information is required to be submitted by 5:00 AM the day before. The Check-out is started subsequent to the 11:00 AM posting of the Day-Ahead unit commitment. The NYISO check-out with all neighboring control areas is typically completed by 18:00.</div> <div>In-Day Hourly: Hourly transaction information is required to be submitted by 90 minutes prior to each hour. The Check-out is performed between 30 minutes to the hour and the start of the hour.</div> <div>Notification Method: by email & the MIS</div>	<div>Day-Ahead: Check-out performed by 12:00. All information is required by 1400 for day-ahead transactions.</div> <div>In-Day Hourly: Check-out with NYISO between 45 minutes to the hour and start of the hour. Running schedules checked 2 times/day at NYISO shift change.</div> <div>Notification Method: by phone & EES/eData</div>	<div>1. Adequate notification.</div> <div>2. Timely reinstatement.</div> <div>3. Rules and procedures that allow for economic choices and options by participants</div>

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	Transaction Check-Out Cont...	<p><u>Transaction Check-out Rules:</u></p> <ul style="list-style-type: none"> Transactions agreed upon using the NERC Tag. Transaction will fail for a NERC Tag Mismatch or if one of the Control Areas does not have the contract. For MW quantity mismatches, the transaction will be scheduled to the lowest value accepted by the affected Control Areas <p><u>Reinstatement Options:</u> Day-Ahead – None</p> <p>Hourly – Corrections must be submitted prior to the next evaluation period.</p> <p>Hourly evaluation begins with the development of the relevant pre-dispatch schedule. This schedule is published at T-40 and includes the Interchange Schedules for each participant.</p>	<p><u>Transaction Check-out Rules:</u></p> <ul style="list-style-type: none"> Transactions agreed upon using the NERC Tag. NYISO MIS number used only if NY cannot locate transaction. Transaction will fail for a NERC Tag Mismatch or if one of the Control Areas does not have the contract. For MW quantity mismatches, the transaction will be scheduled to the lowest value accepted by the affected Control Areas. <p><u>Reinstatement Options:</u> Day-Ahead – Failures due to NERC Tag Mismatch can be corrected prior to 16:00.</p> <p>Hourly – Failed transactions from the Day-Ahead may be resubmitted to the In-Day Hourly evaluation up to 90 minutes before each hour of the next day.</p>	<p><u>Transaction Check-out Rules:</u></p> <ul style="list-style-type: none"> Transactions agreed upon with PJM using the NYISO MIS number. The Check with all other ISOs is by NERC tag. Transaction will fail for a NERC Tag Mismatch or if one of the Control Areas does not have the contract. For MW quantity mismatches, the transaction will be scheduled to the lowest value accepted by the affected Control Areas. <p><u>Reinstatement Options:</u> Day-Ahead – Corrections may be made and submitted into the Hour-Ahead evaluation (up to 90 minutes before each hour of the next day).</p> <p>Hourly – Corrections may be submitted into the MIS 90 minutes before each hour, for the next Hour-Ahead evaluation.</p>	<p><u>Transaction Check-out Rules:</u></p> <ul style="list-style-type: none"> Transactions agreed upon with the NYISO using their MIS numbering. Market Participants are submitting the NY MIS number to PJM as part of their transaction request. For MW quantity mismatches, the transaction will be scheduled to the lowest value accepted by the affected Control Areas. A linked NERC tag is required. <p><u>Reinstatement Options:</u> Day-Ahead – Transaction owners have 60 Minutes from notification (but no later than 14:00) to make corrections when notified of a failed transaction. PJM will make 2 phone attempts to correct errors with the market participant.</p> <p>Hourly – Transaction owners have up to 20 minutes prior to the hour to change or correct transactions.</p>	

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	Transaction Check-Out Cont...	<p>The IMO confirms schedule data with the participant and the participant provides the NERC tag to accompany the transaction. The IMO coordinates with other scheduling entities to ensure transaction reliability. Any IS modifications resulting from this process will be communicated back to the participant verbally.</p> <p><u>Reference:</u></p>	<p>Transactions that initially fail the check-out may be reinstated prior to the start of the hour, as time permits when the discrepancy can be resolved among the affected ISO Control Areas.</p> <p><u>Reference:</u> Transmission Business Practices</p> <p>Transmission Business Process Summary</p> <p>MRP 4 - Submittal of Bilateral Contracts</p> <p>MRP 5 - Energy Market</p> <p>MRP 3 - Bidding</p>	<p>Transactions that initially fail the check-out may be reinstated prior to the start of the hour, as time permits when the discrepancy can be resolved among the affected ISO Control Areas.</p> <p><u>Reference:</u> Transmission and Dispatching Operations – 4.1.3 Interchange Scheduling</p>	<p><u>Reference:</u> PJM Manual for Scheduling Operations, Section 5.</p>	

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2	Ramping of Interchange Transactions	<p><u>Ramp Limit:</u> There are no net interchange ramp restrictions in the Ontario market. The 5-minute real-time dispatch along with the contracted AGC will provide for any expected net interchange.</p> <p><u>Frequency of Ramping:</u> 1 per hour</p> <p><u>Allocation of Ramping Capability:</u> Assigned in economic order</p> <p><u>Reference:</u> Market Rules Chapter 7 Appendix 7.1-3</p>	<p><u>Ramp Limit:</u> No Day ahead ramp limit on individual interchange transactions. Real time net schedule change with adjacent Control Areas is limited to 600 MWs with exceptions</p> <p><u>Frequency of Ramping:</u> 1 per hour</p> <p><u>Allocation of Ramping Capability:</u> Assigned using NERC policy.</p> <p><u>Reference:</u> System Operating Procedure (SOP) 11 - Sections 5.3.1 and 5.3.2 Located at http://www.iso-ne.com/dsop</p>	<p><u>Ramp Limit:</u> The net scheduled interchange ramp limit is nominally 700 MWs in 10 minutes across the top of the hour, however the limit may vary depending on system conditions during the dispatch day.</p> <p><u>Frequency of Ramping:</u> 1 per hour</p> <p><u>Allocation of Ramping Capability:</u> Assigned using NERC priority and economic order.</p> <p><u>Reference:</u> NYISO Ancillary Services Manual, Attachment C – Section Titled Ramped Desired Net Interchange</p>	<p><u>Ramp Limit:</u> The ramp of scheduled transactions is limited to a net of 500 MWs. NY interface ramp limit is 1000 MWs</p> <p><u>Frequency of Ramping:</u> 4 per hour - Allow 500MW net schedule change every 15 minutes</p> <p><u>Allocation of Ramping Capability:</u> Assigned on a first come, first serve basis using a timestamp.</p> <p><u>Reference:</u> Operating Agreement Sched 1, 1.10.6 (b)</p>	<ol style="list-style-type: none"> Maximum flexibility, shortest time-frame, and greater amount (MWs). More frequent schedule changes. Equitable allocation method. Increased degree of coordination.

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3	Transaction Scheduling <ul style="list-style-type: none"> Transmission Service Implementation Rules 	<p><u>Transmission Reservations:</u> Transmission cannot be reserved in Ontario. Transmission access is not explicitly allocated and physical transmission reservation is not required. Access to the Ontario transmission system is based on the outcome of the constrained optimization which uses the prices provided in the "energy" offers and bids only. A "winning" energy offer or bid receives the associated transmission access.</p> <p><u>NERC Transmission Priority:</u> All Interchange Schedules will be "tagged" with the NERC NF-7 Firm transmission designation.</p> <p><u>Reference:</u> Market Rules Chapter 7, Appendix 7.5</p>	<p><u>Transmission Reservations:</u> The Restated NEPOOL Agreement (RNA) covers internal service, therefore no reservation is required for internal transmission.</p> <p>Reservations are required for transactions into, out-of, or through the NEPOOL control area. All external transactions are tracked via their NERC tag.</p> <p><u>NERC Transmission Priority:</u> The Transaction priority is assigned as a result of the OASIS transmission reservation. The type of service (Firm or Non-Firm), and duration (monthly, weekly, daily) define the priority.</p> <p><u>Reference:</u> Made in accordance with NEPOOL O.A.T.T.</p> <p>TSO - General Business Practices Section 2.4.3.</p>	<p><u>Transmission Reservations:</u> Transmission reservations are not used in the NYISO system. The NYISO tariff provides for Firm and Non-Firm Point-To-Point Transmission Service over the transmission facilities of the parties to the ISO/TO Agreement. However, an explicit reservation process is not used since transmission service is assigned to accepted transaction bids through the SCUC and BME evaluation and scheduling process.</p> <p><u>NERC Transmission Priority:</u> The Transaction priority is assigned when the Market Participant enters the transaction into the MIS. Transactions may be submitted to the MIS via the Web as Firm (NERC Level 7) or Non-firm (NERC Levels 1 – 6).</p> <p><u>Reference:</u> OATT Section II. Point-To-Point Transmission Service & III. Network Integration Transmission Service</p>	<p><u>Transmission Reservations:</u> Point-to-Point Service - Long Term Firm (>1 year), Short Term Firm (Monthly, Weekly, Daily), Non-Firm (Monthly, Weekly, Daily, Hourly, On-Peak, Off-Peak), Network Service, Fixed Transmission Rights(FTR) Auctions, Transmission loading Relief (TLR) Buy Through, Ancillary Services.</p> <p>Transmission service may be reserved up to 30 minutes prior to each hour.</p> <p><u>NERC Transmission Priority:</u> NERC priorities are set based on the type of service purchased from PJM , firm or non-firm, and then by the length of the service purchased. NERC has no defined priority for the PJM service to pay through congestion.</p> <p><u>Reference:</u> OATT & Regional Transmission and Energy Scheduling Practices.</p>	<ol style="list-style-type: none"> 1. Minimize transmission reservation time. 2. Maximize the use of the available transmission capacity. 3. Fewer scheduling restrictions. 4. Maximize the ability to change. 5. Ease of transaction scheduling across regional boundaries.

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	Transaction Scheduling Cont...	<p><u>Transaction Scheduling and Restrictions:</u> There are no physical party to party transactions in the Ontario market, only offers to sell and bids to buy from the spot-market.</p> <p>All offers may be changed without restriction up to 4 hours prior to each dispatch hour. From 4 hours out to 2 hours out, offers may be changed on price and/or quantity by no more than +/- 10%. At less than 2 hours, offers can only be changed with ISO approval.</p> <p>Participants may submit standing offers/bids which remain valid until they are removed by the participant.</p> <p>In order to flow, transactions must have a valid NERC Tag and their transaction must successfully pass the inter-CA scheduling process. There are no ramp restrictions imposed by the IMO administered markets but the scheduling process may result in a reduction due to another CA's restrictions.</p>	<p><u>Transaction Scheduling and Restrictions:</u> Day-Ahead transactions must be submitted by 12:00 the day before and must include the associated transmission reservation in order for it to be included in the Day-Ahead unit commitment. No changes are allowed to a Day-Ahead transaction except to correct a NERC tag or for transactions supplied from a generator that has tripped.</p> <p>In order to flow, a transaction must be schedule either day ahead or on Short Notice, and it must be confirmed with the neighboring control areas. While not incorporated in the day ahead scheduling restrictions, ISO-NE must have sufficient ramp capability in real-time (600 MW net interchange limit with adjacent control areas).</p> <p>Short Notice (Hourly) transactions must be submitted 90 minutes before each hour and must be accompanied by a valid transmission reservation.</p>	<p><u>Transaction Scheduling and Restrictions:</u> New transactions may be submitted in the DAM and/or the HAM up to 15 days in advance, however an advanced submission does not give the transaction a scheduling priority. All transactions may be revised up to the closing time of each DAM or HAM evaluation period.</p> <p>DAM transactions may also be revised after the 11:00 AM posting of the day-ahead schedule and prior to the close of each Hour-Ahead evaluation period. Unchanged or unchanged portions of DAM transactions are given scheduling priority in the Hour-Ahead Evaluation over HAM only transactions.</p> <p>In order to flow, a transaction must be scheduled by BME and it must be confirmed with the neighboring control areas.</p>	<p><u>Transaction Scheduling and Restrictions:</u> All transactions may be changed by the transaction owner up to 30 minutes prior to each hour. A change to a Day-Ahead transaction schedule will assign a new timestamp to it. PJM internal ramp priority and curtailment priority consider timestamp.</p> <p>In order to flow, transactions must have a valid NERC Tag, transmission path and associated Transmission service reservation. In addition, the PJM control area must have sufficient ramp capability and the transaction must be confirmed with the neighboring control areas.</p>	

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	Transaction Scheduling Cont...	Reference: Chapter 7 section 3.4.1 and Chapter 8 section 2.1.2 of Market Rules.	Reference: Transmission Business Practices Transmission Business Process Summary MRP 4 - Submittal of Bilateral Contracts MRP 5 – Energy Market MRP 3 – Bidding	Reference: Market Services Tariff, Attachment B, Section III. Bilateral Transaction Bidding, Scheduling And Curtailment	Reference: Scheduling Manual, Section 5.	

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4	Transaction Curtailment <ul style="list-style-type: none"> Rules Notification 	<p><u>Rules:</u> Inter-ISO curtailment rules are still under development. The IMO will curtail inter-tie transactions consistent with good utility practice and in accordance with industry policy such as NERC TLR.</p> <p>Curtailments within the hour for security will be made when generation and/or dispatchable loads within Ontario cannot be dispatched to solve the security constraint.</p> <p><u>Notification:</u> Notifications are made by phone and as soon as possible.</p> <p><u>Reference:</u></p>	<p><u>Rules:</u> Curtailments are performed in accordance with NEPOOL O.A.T.T. and General Business Practices Section 1.5.5 The order of curtailments for transactions to NY are: short notice (first), then dispatchable and must take transactions are curtailed in order of transmission priority.</p> <p><u>Notification:</u> For in hour curtailments, the parties are notified through the tag adjustment software.</p> <p><u>Reference:</u> O.A.T.T. General Business Practices Section 1.5.5</p>	<p><u>Rules:</u> Real-Time/In-hour Curtailments: Non-Firm Transactions (NERC Level 1-6) are curtailed when congestion occurs between the contracts source and sink.</p> <p>Firm Transactions (NERC Level 7) are curtailed for system security.</p> <p>Transactions of equal priorities are selected for curtailment using decremental bids and curtailments within equal decremental bids are curtailed on a prorated basis.</p> <p><u>Notification:</u> A transaction specific email is sent to owners of the affected transactions & a generic curtailment message is posted to the web.</p> <p><u>Reference:</u> OATT Section 13.6, 14.7 & 33.0 Attachment J, Section III. Transmission Service Curtailment</p>	<p><u>Rules:</u> Transmission users may choose curtailment or pay through congestion.</p> <p>When transmission is curtailed, non-firm customers indicating that they are not willing to pay congestion will be curtailed</p> <p><u>Notification:</u> The PJM Transaction Dispatcher calls the PJM Market Participant. This applies when PJM is either the source or sink.</p> <p><u>Reference:</u> OATT 1.7, 13.6, 14.7, 33. Manual for Scheduling Operations Sect. 5</p>	<ol style="list-style-type: none"> 1. Adequate notification. 2. Timely reinstatement. 3. Rules and procedures that allow for economic choices and options by participants. 4. Transparency of information. 5. Minimize curtailments resulting from errors.

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5	ATC	<p><u>Frequency of Updates:</u> The IMO is not posting ATC on OASIS, but a similar quantity will be forecast for use in the financial transmission rights market. Daily posting of transmission capability will be available through System Status Reports.</p> <p>Updated: a) 2 days out b) 1 day out at 5:30 and 10:30 based on the predispatch evaluation c) In real-time during the dispatch day.</p> <p><u>Base Assumptions:</u></p>	<p><u>Frequency of Updates:</u> ATC is decremented by acceptance of OASIS requests until noon day-ahead of contract. After the day-ahead evaluation, unscheduled reservations are added to ATC for Short Notice (Hourly) reservations. ISO-NE posts an "IN ATC" and an "OUT ATC" which are not netted and are posted by interface.</p> <p><u>Base Assumptions:</u> Calculation of the ATC is in the OASIS Related Document relating to Total Transmission Capability (TTC), Transmission Reliability Margin (TRM), and Available Transmission Capability (ATC). Base calculation of TTC begins with all lines in-service and then accounts for specific line outages. The TTC is then decremented for reservations to obtain the ATC.</p>	<p><u>Frequency of Updates:</u> ATC/TTC calculated and posted on the NYISO OASIS for each interface in the NY control area.</p> <p>Updated: a) Day-Ahead with the 11:00 AM SCUC posting. b) Hourly based on transactions accepted through the BME Hour-ahead posting.</p> <p><u>Base Assumptions:</u> Transfer Capability of the transmission network is limited by physical and electrical characteristics of the system including thermal, equipment loading, voltage and stability considerations. Transfer capability is evaluated based on base system loading and an assessment of critical contingencies on the Transmission System.</p>	<p><u>Frequency of Updates:</u> Posts TTC, firm and non-firm ATC for 27 transmission paths. Updated: a) every business day for the next 7 days b) weekly for the next 4 weeks c) monthly for the next 12 months. Updates maybe made more frequently as needed.</p> <p><u>Base Assumptions:</u> PJM limits transfers so as to not exceed first contingency total transfer capability. Paths with low activity may initially be restricted to a nominal conservative value. If forecasted conditions remain unchanged, TTC and ATC will increase as the time frame decreases, due to a reduction of margins. Through paths are the lower of the individual path calculations.</p>	<ol style="list-style-type: none"> 1. Timely notification when TTCs change. 2. Frequent updates of TTCs to reflect the current system configuration. 3. Equivalent base assumptions in TTC calculations among the Control Areas.

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	ATC Cont...		<p>The critical contingencies will be defined as appropriate using guidelines set forth in ISO Procedures. Determination of ATC will require, in all cases, that base system conditions and expected generation levels be identified and modeled for the period being analyzed. These conditions will include projected customer demand, anticipated transmission system facility availability, accepted transactions, and information about neighboring control areas that affect the transfer capability. The ISO's calculation of transfer capability will be consistent with NERC principles.</p>	<p>The critical contingencies will be defined as appropriate using guidelines set forth in ISO Procedures. Determination of ATC will require, in all cases, that base system conditions be identified and modeled for the period being analyzed. These conditions will include projected customer Demand, anticipated Transmission System facility availability, accepted Energy Transactions for the NYCA, and information about neighboring regions that affect the Transfer Capability of the NYCA. The ISO's calculation of Transfer Capability will be consistent with NERC principles.</p>	<p>Transfer capability depends on projections of system conditions including system topology, generation dispatch, load and transactions. Regional coordination of transfer capability is done through a number of data exchanges to promote accurate ATC calculations. This does not involve posting the lowest result of ATC paths on separate OASIS sites.</p> <p>A portion of TTC is set aside for Transmission Reliability Margin composed of Load forecast uncertainty, loop flow, and normal operating margins. Load forecast margin is applied to Firm ATC with PJM as the sink and is 2.2% for the first day and 6% thereafter. Loop flow margin is applied to Firm ATC when PJM is the source or sink and is based on historical loop flows. Normal Operating margin is applied to Firm and Non-Firm ATC when PJM is the source or sink and is set as 5% of the base TTC.</p>	

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	ATC Cont...	<p><u>Reference:</u> Chapter 8, Section 4.7 of Market Rules.</p> <p>Chapter 7, Section 12 – Deviation of transmission ratings from normal values.</p>	<p><u>Reference:</u> OASIS Related Document, Total Transmission Capability (TTC), Transmission Reliability Margin (TRM), and Available Transmission Capability (ATC)</p>	<p><u>Reference:</u> OATT, Attachment C - Methodology To Assess Available Transfer Capability</p>	<p><u>Reference:</u> Manual for Transmission Service Request Section 2</p> <p>OATT 15.2</p>	
6	Capacity Market	There will not be a capacity market in Ontario at market opening. One is contemplated, if IMO Board determines that future reliability is deemed to be in jeopardy. [See Chapter 7 section 10 of Market Rules.]	The auction market has been eliminated, but the requirement remains. A deficiency charge of \$0.17/kW Month.	<p>The NYISO determines the ICAP requirement for an LSE for each six month capability period. The LSE may contract directly with a qualified ICAP provider to meet some or all of its ICAP requirement. ICAP may also be purchased through the NYISO's ICAP auction in 1 month blocks and up to a maximum of 6 months. During the capability period, an LSE that is deficient in ICAP, may seek-out and contract for additional ICAP to meet their deficiency. If the LSE remains deficient, ICAP will be purchased for them via the NYISO's ICAP deficiency auction.</p> <p>Market Services Tariff, Section 5.12 - 5.15</p>	<p>Monthly. Daily markets for unforced Capacity Credits</p> <p>Operating Agreement Schedule 11</p>	

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7	Recall of Capacity See the MOU Website – ISO Emergency Procedures Comparison Chart for the steps each ISO follows in an emergency and were Recall of Capacity fits in that sequence.	Ontario's capacity market (when implemented) is unlike the ICAP markets others in the MOU employ. There is no recall "capacity" in the operation of the Ontario market. Export energy that has been offered into and accepted by the IMO Operating Reserve (OR) market can however be withdrawn if OR energy activation is required. <u>Reference:</u>	Recallable Energy Types: E1 – Is recallable with 10-minutes notice E2 – Is Capacity Backed and sold above and beyond reserves Will Recall ISO-NE Contract Energy to restore 10 Minute Reserves. Will Recall Non-ISO-NE Contract energy as a last step, prior to shedding load. <u>Reference:</u> Recalled Under OP4 MRP - 4 Submittal of Bilateral Contracts - section 4.3.3.A	The NYISO follows established procedures, consistent with maintaining the reliability of the NYS Transmission System, to eliminate shortages in total operating reserves by exercising its discretion to purchase emergency energy or curtail an ICAP transaction. <u>Reference:</u> Market Services Tariff, Section 5.12.7 - Recall Procedures	In Emergencies, energy scheduled external to PJM from capacity resources is recalled. <u>Reference:</u> Operating Agreement p. 118F.	1. Common ICAP rules and definitions across all ISOs. 2. Provide the ability to register generators as ICAP providers in multiple markets.

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8	Trading Hubs	<p><u>Trading Hubs:</u> No</p> <p><u>Reference:</u> NA</p>	<p><u>Trading Hubs:</u> No</p> <p><u>Reference:</u> NA</p>	<p><u>Trading Hubs:</u> No</p> <p><u>Reference:</u> NA</p>	<p><u>Trading Hubs:</u> Yes, PJM has Three Trading Hubs. They are West, Western Interface, and East.</p> <p><u>Reference:</u> Regional Transmission and Energy Scheduling Practices.</p>	<ol style="list-style-type: none"> 1. Establish hubs that will encourage liquid futures markets. 2. Provide settlements systems that accommodate hubs. 3. Establish hubs that will facilitate virtual trading.

