IESO Annual Update to the Ontario Energy Board on Actions Taken to Address Market Surveillance Panel Recommendations (Period from January 2019 – December 2023)

IESO Licence Obligation under Section 6.2.5

Provide the Board, on or before the end of each calendar year, with the status of actions taken by the Licensee further to all recommendations addressed to the Licensee in any report issued by the Market Surveillance Panel in that year and the preceding four calendar years to the extent that they remain outstanding and, where no action has been taken in relation to a recommendation, the rationale for not taking action. The Licensee's response to recommendations in any report issued by the Market Surveillance Panel within 30 days of the end of the calendar year will be included in the succeeding report.

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April 29, 2019	3-1(A)	The IESO should formalize the process by which it determines when to disable and re-enable the variable forecasting tool and should communicate that process to market participants to increase transparency.	In December 2019, the IESO amended Market Manuals to include that the IESO will issue an advisory notice when the tool is disabled/re-enabled and the circumstances under which the IESO may disable the forecast.

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April 29, 2019	3-1(B)	When a variable generator is on mandatory dispatch and the forecasting tool is disabled, the IESO should set the generator's unconstrained schedule at its forecasted output rather than its maximum offered capacity.	The IESO implemented a tool change in October 2020. Variable generators receiving mandatory dispatch will have their market schedules set to their 5-minute forecast even when the 5-minute variable generation forecast tool has been disabled.
December 19, 2019	2-1	The IESO should consider ways and means of deterring the Operating Reserve nodal price chasing behaviour.	The IESO shares the Market Surveillance Panel's (MSP) concern that a market participant is being compensated more than internal resources for the same Operating Reserve (OR) service. IESO analysis has determined the "root cause" of the issue to be the different timeframes for scheduling OR from imports (hour-ahead) vs internal supply (every five minutes in real-time). This market design can lead to instances where OR from imports are scheduled in pre-dispatch even if lower cost supply offers were available in real-time. Aligning the scheduling timeframe for OR imports with internally supplied OR on a 5-minute basis would level the playing field and address the root cause. The IESO has identified a market improvement project to schedule OR imports on a 5-minute basis. Due to existing priorities and the focus on the Market Renewal Program (MRP), this

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			recommendation is on hold. The IESO will revisit this recommendation once MRP has been implemented.
December 19, 2019	2-2	The IESO should ensure its procedure for determining an outage when administering Transmission Rights aligns with the Market Rules.	The IESO agrees with the MSP's recommendation and acknowledged the Transmission Rights (TR) payments made during outages may not be aligned with existing Market Rules. The IESO held a public webinar in March 2020 to identify this issue to stakeholders and discuss next steps. An interim, manual solution was implemented in April 2020 to stop the improper payments to TR holders. An enduring, automated solution was implemented in October 2020.
December 19, 2019	3-1(A)	A) The Panel recommends that - when implementing changes to the market - the IESO audit the pre-deployment testing process to ensure that sufficient controls are in place to identify errors and unintended consequences.	Internal Audit has completed its review of the IESO's pre-implementation testing. The results of this review were presented to the Audit Committee of the IESO Board on March 8, 2021. Overall, the audit noted that an enhanced quality assurance program is well positioned to provide independent quality assurance for current approved projects. Internal Audit made 4

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			medium and 1 low risk observations in the review. Actions were implemented by the end of 2021.
December 19, 2019	3-1(B)	B) The Panel recommends that, as soon as possible after the IESO detects an error or unintended consequence that significantly impacts the wholesale electricity market, it publicly discloses details of the error or unintended consequence, the impact on the market and the actions taken or to be taken to address the matter.	The IESO has completed the enhancement and formalization of its process for reporting significant anomalous market events, including materiality thresholds, to the public. The enhanced process includes provisions for publicly disclosing the details of the error, an assessment of the error from a market impact perspective, and actions taken to address the error, when materiality thresholds have been met and when approval to disclose has been given by the IESO Board of Directors. This process was finalized in Q2 2021.

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July 16, 2020	3-2	In order to provide more consistent market outcomes, the IESO should give further consideration to improving how the need for additional system flexibility is addressed, such as specifying the conditions that require intervention and scheduling the required amount of spinning reserve explicitly in the normal OR market. Although it is acknowledged that no industry standard exists to address flexibility, alternative solutions should also be considered to ensure the most suitable approach is used.	Given the changes to the MRP Go-live dates the IESO initiated the review and impact assessment of the OR flexibility solutions. The IESO is completing the fulsome review of the existing solution, and the implementation of changes is expected to be completed by Q2-2024. The IESO continues to track industry best practices to address flexibility and monitor the effectiveness of the existing solution.
December 10, 2020	2-1	The IESO should eliminate the payment for start-up costs for second and subsequent RT-GCG runs in a day. Alternatively, when a generation unit has participated in the RT-GCG program once during a day, the IESO should consider ways to have the generation unit compensated on the basis of the lesser of the second and subsequent submitted start-up costs or the estimated cost of keeping the generation unit online between RT-GCG runs.	The IESO agrees that two-shifting generation facilities could be inefficient in certain circumstances. However, eliminating all second start guarantees could deter efficient starts from coming to market. Multi-hour optimization of three-part offers is necessary to verify the efficiency of second starts. As part of the Market Renewal Program (MRP), the IESO will be introducing multi-hour optimization of three-part offers (energy, start up, and speed-no-load) across the day-ahead, pre-dispatch, and real-time timeframes. Multi-hour optimization of

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			three-part offers will only schedule generation facilities for two starts in the same day when it is economically efficient to do so. The IESO does not intend to take any additional actions to change the current Real-Time Generation Cost Guarantee (RT-GCG) program design in advance of MRP. The IESO will continue to conduct audits associated with the RT-GCG program.
December 10, 2020	2-2	The IESO should conduct an audit of RT-GCG cost submissions in situations when a generation unit has a second RT-GCG run within three hours of its first RT-GCG run and the submitted costs of the second run are equal to or higher than the submitted costs of the first run.	The IESO routinely audits the Real-Time Generation Cost Guarantee (RT-GCG) program and has been carrying out such audits since 2011. Consistent with the MSP's recommendation, the IESO's audits consider submitted costs and the circumstances of each RT-GCG start, including when a generation facility has a second start within three hours of its first start.
December 10, 2020	2-3	The IESO should treat SAR activations in much the same way as it treats emergency imports; namely, by adding demand back in to the unconstrained schedule.	The current approach to pricing Simultaneous Activation Reserve (SAR) imports has been included in the Market Renewal Program (MRP) detailed design (see section 3.8.9.2 of the Grid and Market Operations Integration Detailed Design for further information) and stakeholders

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			were given the opportunity to provide input on this approach. In addition, the IESO has assessed the materiality of SAR imports to be low both in terms of frequency of activation and impact on the Hourly Ontario Energy Price (HOEP). With SAR event pricing recently addressed through MRP and the materiality assessed as low, the IESO does not intend to pursue this recommendation any further at this time.
December 10, 2020	3-1	The IESO should produce a report that probabilistically assesses the level of economic (i.e. non-firm) imports that would be appropriate to assume in their various resource adequacy studies for each year in the planning timeframe, with stakeholder input, using the Northeast Power Coordinating Council Review of Interconnection Assistance Reliability Benefits study as a reference.	Through the Reliability Standards Review stakeholder engagement, the IESO reviewed assumptions related to compliance with Northeast Power Coordinating Council (NPCC) resource adequacy standards (NPCC "Directory 1"), including assumptions for non-firm imports. Through this engagement, the IESO proposed a methodology to determine an appropriate assumption for non-firm imports which takes into account the NPCC Review of Interconnection Assistance Reliability Benefits study. The Reliability Standards Review concluded on April 9, 2021. The stakeholdered methodology to determine an appropriate assumption for non-firm imports was

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			included in the assessments for the 2021 Annual Planning Outlook (APO). The methodology is now included in the IESO's annual process.
December 10, 2020	3-2	The IESO should better align the assumptions used in planning documents on an ongoing basis or explain in detail the reason for remaining differences, with quantities. This should address, at a minimum, differences in economic import assumptions and different weather scenarios that lead to different capacity need outcomes.	The IESO agrees with the MSP on the need to align assumptions used in planning documents. As stated in last update, assumptions for the Reliability Outlook (RO) and Annual Planning Outlook (APO) forecasts were included in the planning documents. Differences in assumptions across these reports will be quantified in the associated methodology documents. There is general alignment in terms of weather assumptions, embedded variable generation, and historical data-sets used. The RO will be updated to, among other things, adopt the updated weather methodology consistent with what is in the APO. Continuing alignment between the two forecasts is an objective of the capital Long-Term Demand Forecast Project. Additional insights on alignment will be gathered during external stakeholder engagement to be completed in 2024.

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December 10, 2020	3-3	The IESO should examine and report on potential improvements to its communications with stakeholders regarding the process(es) used to assess the need for and procure resources to meet future capacity needs. The IESO should also provide greater clarity regarding the documents used to inform those procurements and how any auction or procurement targets are set. In particular: • the IESO should publish the analysis and methodology for the Reliability Assurance concept, which appears to be the basis for procuring capacity for the Capacity Auction scheduled for the winter of 2020/21; and • the IESO should explain the purpose of the Reliability Outlook, including a clear indication of which sections of that report may be used for outage planning, which sections (if any) may be used to inform procurements, and which sections have been included for informational purposes only.	The IESO agrees with the MSP on the need for transparent and clear communications for planning and procurement processes. Through the Resource Adequacy engagement, the IESO worked with stakeholders to develop a resource adequacy framework that will enable competitive solutions to meet system needs. The IESO's documents clearly outline how system needs are identified, the methods used to translate those needs into procurement targets, and which processes will be used to procure resources. The IESO can confirm that: • The Annual Planning Outlook (APO) assesses system needs and includes a description of the methodologies used to assess system needs. • The Annual Acquisition Report (AAR) translates those needs into procurement targets and serves as the primary source for procurement decisions. The procurement targets outlined in the AAR do not include additional volumes for "Reliability Assurance." The Reliability Outlook is not used to inform procurements targets. While the Reliability Outlook can assist market participants in assessing outage plans, Market Manual 7.3 is the document that governs the outage assessment process. The purpose of the Reliability Outlook is specified within the Reliability Outlook itself and includes:

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			• Advising market participants of the resource and transmission reliability of the Ontario electricity system • Assessing potentially adverse conditions that might be avoided by adjusting or coordinating maintenance plans for generation and transmission equipment • Reporting on initiatives being implemented to improve reliability within this time frame
December 10, 2020	3-4	The IESO should periodically make available clear descriptions of the range of potential resources that may need to be procured, including the volume (MW), timelines, any required characteristics other than capacity (e.g. energy, ramp, etc.) and expected procurement mechanism (e.g. through capacity auctions, and/or alternative mechanisms) as part of its communication of future capacity needs in reports such as the Annual Planning Outlook.	The IESO agrees with the MSP on the need for transparent and clear communications for planning and procurement processes. Through the Resource Adequacy Engagement, the IESO worked with stakeholders to develop a framework that translates system needs to transparent procurement targets. The Annual Planning Outlook (APO) assesses system needs and includes a description of the methodologies used to assess system needs. The Annual Acquisition Report (AAR) translates those needs into procurement targets and serves as the primary source for procurement decisions. The AAR includes descriptions of resources to be procured, including the volume (MW), timelines, any required characteristics other than capacity, and expected procurement mechanism.

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December 10, 2020	3-5	The IESO should signal its confidence in different planning assumptions by publishing the uncertainty values associated with relevant assumptions and elements used to calculate the capacity need, including at a minimum a range of economic imports and a range of possible demand forecasts based on underlying economic drivers.	Through the Reliability Standards Review engagement, the IESO developed a stakeholdered methodology to determine an appropriate assumption for non-firm imports which will be included in each Annual Planning Outlook (APO). To address uncertainties impacting electricity demand, the IESO builds consideration for load forecast uncertainty into the APO. Assumptions are explained in the APO and are supported through accompanying methodology documents and data tables. The IESO expects to continue this practice. Further, through the Resource Adequacy Engagement, stakeholders and the IESO have recognized a need for an acquisition report that clearly states the IESO's procurement need in the form of the Annual Acquisition Report (AAR). The AAR supplements the IESO's efforts to publicly acknowledge uncertainty in planning assumptions by considering the inherent uncertainties within those assumptions as it translates needs into procurement targets.
December 10, 2020	3-6	The IESO should examine and report on potential improvements to its	The IESO continues to review the MSP's recommendation. The IESO's review is not

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		stakeholder engagements regarding the methods and assumptions used to develop capacity needs. Specific consideration should be given to a periodic streamlined process to review the case for procuring existing or new resources that involves stakeholders and is overseen by an objective third party.	expected to conclude in advance of the Ministry of Energy's review of the long-term energy planning framework. IESO has provided advice into the Electrification and Energy Transition Panel (EETP), tasked with reviewing Long-Term Energy Planning and will work with the Ministry and the OEB to implement EETP recommendations once they are issued
September 2, 2021	3-1	The IESO should develop structural solutions for Capacity Auction resource performance failures, with an emphasis on stronger penalties. In general terms, penalties should work together with a Qualified Capacity process to ensure that capacity payments net of penalties reflect each resource's ability to deliver capacity when dispatched.	The IESO agrees with the MSP's recommendation and has stakeholdered a design for a capacity qualification process and an enhanced performance and availability assessment framework for all Capacity Auction resources (including Hourly Demand Response), where past performance would directly impact future qualified capacity and participant revenues. The Market Rules to implement this design have been approved. The new design will provide a financial incentive for resources to improve performance, much stronger financial consequences for poor performance during times of system need and ensure capacity payments net of penalties reflect a resource's ability to deliver capacity when dispatched.

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			The capacity qualification process will have two components (1) availability de-rates, and (2) performance adjustment factors. Availability de-rates will come into effect during the qualification for the 2023 Capacity Auction, which is expected to run in Q4 2023. Due to internal assessments and stakeholder feedback, the performance adjustment factors will be calculated based on auction performance in 2023/24 and will apply to qualification in the 2024 Capacity Auction. This will ensure that performance baselines are being assessed with the new enhancements to the performance assessment framework in effect (e.g. tighter dead bands and higher availability charges). Due to the unique Hourly Demand Response participation framework, there is no real-time availability data for the IESO to use to determine an availability de-rate for qualification. For Hourly Demand Response resources, IESO has proposed to subject the resource to a higher availability performance assessment when on standby. As an alternative the self-scheduled capacity test performance may be used to adjust the obligation and revenues during the obligation period. These proposals are further described in

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			the update to September 2021 recommendation 3-2.
September 2, 2021	3-2	For all Capacity Auction resources, the IESO should adjust penalties and payments such that there are no financial incentives to submit Capacity Auction offers that exceed expected capabilities.	The IESO agrees with the MSP's recommendation and has stakeholdered a design for a capacity qualification process and an enhanced performance and availability assessment framework for all Capacity Auction resources (including Hourly Demand Response - HDR) where past performance will directly impact future qualified capacity and participant revenues. The Market Rules to implement this design have been approved. Enhancements to the performance assessment framework include performance testing to capability (rather than bids), tightening performance dead bands for hourly demand response resources, determining performance adjustment factors to apply in the future capacity qualification of an individual resource and an in-period adjustment of obligations and payments in accordance with the demonstrated capability of HDR resources. IESO had initially proposed a settlement charge that would incent HDR resources to make their capacity available during times of system need but has since pursued a new approach to

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			determine an alternative to an HDR availability de-rate in qualification based on further engagement with stakeholders. This design enhancement proposes to adjust an HDR resource's obligation and availability payments for the entire obligation period, including a retroactive adjustment, based on actual delivered capacity demonstrated during a capacity test, if the resource does not deliver to at least its cleared UCAP value. Total availability payments received throughout the obligation period, including payments received prior to the test and performance assessment, would be included in the payment adjustment. This new proposal was developed based on stakeholder feedback that the IESO's previous approach would incent the wrong behaviour and utilized aspects of approaches to assess availability that are used in other jurisdictions that stakeholders suggested the IESO consider. The 2023 Capacity Auction market rules were amended in 2 parts. The first stream was approved and effective July 19, 2023. Stream 2 was approved and effective October 23, 2023.
September 2, 2021	3-3	The IESO should immediately cease reimbursements to gas generators of carbon cost payments.	The Real-Time Generation Cost Guarantee (RT-GCG) program ensures that non-quick start generators are available to meet reliability in

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			real-time. The RT-GCG Program is not a full cost-recovery program. The objective of the program is to provide eligible generators recovery of certain incremental fuel, operating, and maintenance costs incurred as a result of starting up and ramping to minimum loading point, to the extent those costs are not recovered through market revenues. Carbon costs are an additional operating cost incurred by generators during the start-up period and the IESO considers recovery of these costs to be consistent with the program's methodology, and appropriately reimbursed. In the short term, the RT-GCG program will continue to pass through carbon costs to customers to ensure reliability consistent with the current program design as set out in 2017. In the future, the Market Renewal Program (MRP) will introduce the enhanced real-time unit commitment process which will facilitate enhanced competition between generators based on their all-in costs, including carbon costs. MRP will be in service by May 2025.

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September 2, 2021	3-4	If the IESO insists on reimbursement of carbon cost payments, they should develop a methodology that preserves the incentives of the carbon price. Any reimbursement should amount to a small percentage of the carbon cost payments imposed by the carbon pricing system. Only facilities that have paid an annual carbon cost charge should qualify for the carbon cost reimbursement.	The Real-Time Generation Cost-Guarantee (RT-GCG) program's current carbon cost recovery methodology is designed to accurately reflect the eligible carbon costs incurred by generators. This methodology considers the heat rate of thermal generators by assessing the fuel consumed and energy produced specific to start-up operations. With further carbon costs potentially incurred during the full run of a facility, an incentive to reduce emissions intensity and resulting carbon costs remains. The IESO also notes that based on the current emissions intensity benchmark and the dispatch patterns and efficiency of Ontario's gas fleet, all eligible RT-GCG participants are expected to incur an annual carbon charge. As noted in response to recommendation 3-3 from the Market Surveillance Panel's September 2021 report, in the short term, the RT-GCG program will continue to pass through carbon costs to customers to ensure reliability consistent with the current program design as set out in 2017. In the future, the Market Renewal Program (MRP) will introduce the enhanced real-time unit commitment process which will

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			facilitate enhanced competition between generators based on their all-in costs, including carbon costs. MRP will be in service by May 2025.
September 2, 2021	3-5	If the IESO does reimburse gas generators for carbon cost payments, the total annual reimbursement from the IESO should be made public to improve transparency, beginning with the total reimbursement to gas generators for 2019 that was made in 2021.	The IESO agrees with the MSP's recommendation and has published the total annual reimbursement for carbon costs under the Real-Time Generation Cost Guarantee (RT-GCG) on the IESO's Market Assessment web page.
September 2, 2021	3-6	The IESO should issue a Request for Proposals in all possible cases where it intends to secure a resource to meet an identified system need that cannot be addressed by existing competitive mechanisms (e.g. Capacity Auction).	The IESO is committed to prioritizing the use of competitive mechanisms. The 2022 Annual Acquisition Report (AAR), published on April 4, includes the decision making methodology used to determine solutions to address identified reliability needs. The planned actions and options identified in the 2022 AAR include a variety of competitive processes, including Request for Proposals. The AAR encourages greater competition by specifying design considerations in long-term commitment processes in locations where system needs exist and there are

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			currently limited capable suppliers to address the need. During the mechanism allocation and target setting step of the methodology, the IESO determines which mechanisms from the Resource Adequacy Framework have a high probability of delivering on the needs, taking into consideration whether: (1) there is sufficient time to run a competitive procurement, and (2) a sufficient pool of potential resources or projects exist to support competition. Where competitive mechanisms cannot be implemented, either due to urgency of need or specific requirements that reduce the pool of competition, opportunities such as existing assets, potential import opportunities, or other means are considered to satisfy the identified needs.
September 2, 2021	3-7	In advance of full implementation of the IESO's Resource Adequacy Framework, when non-competitive procurements may be required, information should be published that clearly states why a non-competitive procurement was necessary, what effort was made to encourage	The 2022 Annual Acquisition Report (AAR), published on April 4 2022, provides information on the IESO's decision making methodology that is used to determine planned actions to meet identified reliability needs, including the need for non-competitive procurement mechanisms.

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		competition, specific details for both the need and the proposed solution (e.g. amount of annual Unforced Capacity and location), and whether additional actions are necessary if the proposed solution provides more, or less, than what is required.	The AAR includes a summary of information on the needs being addressed (with references to additional public information available through the Annual Planning Outlook or Transmission Plans, as appropriate), the proposed solution, and the risks that were considered in determining the set of planned actions to meet reliability needs. When proposing a non-competitive solution, the AAR provides a signal to the marketplace that there is a need to be met, by clearly and transparently articulating the need and recognizing that a competitive process could be used in the future to meet the need if sufficient resources are available to support competition. The AAR also includes a discussion on activities to enable greater competition and, where needs exist in a specific location, encourages competition by specifying those needs as design considerations in long-term RFPs. The IESO expects to continue to provide this information to stakeholders in future AARs.
September 2, 2021	3-8	To facilitate the inclusion of projects with broader public benefits in competitive procurement processes, the	The IESO is aware that some facilities or projects may provide public benefits beyond those related to the electricity system. Through the

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		IESO should separate non-electricity system costs and benefits from the electricity system cost-benefit analysis and publish the results.	operationalization of the Resource Adequacy Framework via the Annual Acquisition Report and subsequent procurement activities, the IESO is shifting the procurement focus from a resource-centric to a system-centric approach, where eligible facilities compete to provide the electricity services needed to maintain a reliable electricity system. The identified needs, ensuing procurements, and ultimately procurement outcomes will help to transparently identify the benefits and costs to provide these electricity services. However, accounting for any other non-electricity benefits that may materialize from a procurement, outside of the IESO's objects, is not part of the IESO's mandate. Other public benefits are best assessed and published by the appropriate branch of Government, who can assign a value to the public benefit, and determine how much of the cost of that benefit should be attributed to electricity ratepayers. In these instances, the Government is best positioned to provide policy direction to the IESO in cases where these non-electricity benefits are to be factored into electricity system decisions.

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			With regard to bilateral arrangements, including those that are part of the Ministry of Energy's Unsolicited Proposal assessment process specifically, the IESO would be unable to publish the results of its assessments as these contain third-party confidential information. Furthermore, as part of the Unsolicited Proposal process, this information is provided as confidential advice to government. Information on the project valuation framework used by the IESO to assess a broad range of projects, including Unsolicited Proposals, is available on the IESO's website