Minutes of the IESO Technical Panel Meeting

Meeting date: November 10, 2026
Meeting time: 9:00 a.m.– 10:46 a.m.
Meeting location: In-Person/Virtual

Chair/Sponsor: Michael Lyle

Scribe: Trisha Hickson, IESO

Please report any suggested comments/edits by email to engagement@ieso.ca.

Invitees	Representing	Attendance Status Attended, Regrets
Rob Coulbeck	Importers/Exporters	Attended
Dave Forsyth	Market Participant Consumers	Attended
Jennifer Jayapalan	Energy Storage	Attended
Forrest Pengra	Residential Consumers	Attended
Robert Reinmuller	Transmitters	Attended
Cory Cook	Consumers (non-market participants)	Regrets
Rupali Jain	Energy Related Businesses and Service	Regrets
Margaret Koontz	Generators	Attended
Vlad Urukov	Market Participant Generators	Attended
Michael Pohlod	Demand Response	Regrets
Matthew China	Energy Related Businesses and Services	Regrets
Umar Waqas	Distributors	Attended
Devon Huber	IESO	Attended
Michael Lyle	Chair	Attended
Secretariat		
Trisha Hickson	IESO	Attended

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IESO Presenters/Attendees	
Presenters:	**Attendees:**
Tim Lam	Jo Chung
Darren Byers	Robin Bates

Agenda Item 1: Introduction and Administration

Trisha Hickson welcomed everyone joining the meeting.

The meeting agenda was approved on a motion by Robert Reinmuller.

The October 14, 2026, meeting minutes were approved on a motion by Vlad Urukov.

Introductory Remarks from the Chair:

Michael Lyle, Chair noted that the annual joint meeting of the Technical Panel and the Markets Committee of the IESO Board is scheduled for December 10th. The meeting will be held virtually, beginning at approximately 9:50 a.m., and is expected to last about 20 minutes. Vlad Urukov will give introductory remarks on behalf of the Technical Panel at the session. To help make the discussion as productive as possible, Mr. Lyle asked Panel members to submit any suggested discussion topics by December 1st. Potential topics will be discussed at the December 1st meeting in advance of the session with the Markets Committee.

Mr. Lyle also noted, for the Panel's awareness, that the IESO Board approved an urgent market rule amendment on October 30th to enable a new uplift supporting the acquisition of short-term capacity. Market participants were notified through a market communication issued on October 30th, and Trisha Hickson also shared a link to the supporting amendment materials with Panel members last week.

Agenda Item 2: Engagement Update

Trisha Hickson provided an update on the prospective schedule and upcoming engagement activities. Ms. Hickson noted that the Large Computational Loads (LCL) education item originally scheduled for November has been deferred to December to allow additional time for preparation and stakeholder engagement activities. Ms. Hickson also noted that the Market Assessment and Compliance Division's Enforcement Modernization initiative is currently planned as an education and update item for the January 2027 Technical Panel meeting. She also noted on the prospective schedule that an Enabling Resources Program (ERP) education session will be presented at the December Technical Panel meeting.

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- Vlad Urukov sought clarification regarding the phased education and batch approach for the Enabling Resources Program.

James Hunter confirmed that the initiative would proceed through multiple education sessions of the ERP batches; however, the Technical Panel will be asked to consider a single vote on the final, consolidated amendment proposal package rather than separate votes on each batch.

Item 3: Pseudo-Unit Updates

Darren Byers noted that the proposed amendments would improve how pseudo-units are scheduled in the pre-dispatch, day-ahead, and real-time markets by improving how outages, de-rates, constraints, and ramp rates are reflected in dispatch outcomes. Following the vote to post and stakeholder review, one submission was received from Vlad Urukov. Revisions were made in response to those comments, and an additional clarification on sequencing when a constraint or de-rate no longer applies was made in Appendix 7.6, section 8.6.2.3. The associated materials are available on the Technical Panel webpage.

- Robert Reinmuller observed that the revisions arising from stakeholder comments appeared primarily to provide clarification rather than substantive changes to the proposal.

Mr. Byers agreed and noted that most of the comments related to improving clarity within the market rule provisions.

- Umar Waqas asked whether the proposed amendments would introduce any new obligations, cost implications, or operational impacts for distributors or distribution-connected market participants.

Mr. Byers noted that the proposed amendments are focused on dispatch scheduling for generators and are intended to improve how pseudo-units are represented in the IESO's scheduling systems.

Eric Lui confirmed that the amendments are limited to pseudo-unit provisions and do not introduce new obligations or cost impacts for distributors or distribution-connected market participants.

On a motion moved by Jennifer Jayapalan, the Technical Panel unanimously voted to recommend the market rule amendments for IESO Board approval.

Item 4: Adding De-Rates to the Real-Time Lost Cost Economic Operating Point

Mr. Byers advised that the proposed amendments would reduce inappropriate real-time make-whole payments by aligning economic operating point calculations with dispatch optimization logic and actual resource capabilities. Following the vote to post and stakeholder review, one set of comments was received from Vlad Urukov, resulting in a simplification of a formula within the amendment package. The associated materials are available on the Technical Panel webpage.

- Mr. Reinmuller thanked Mr. Urukov for being so precise and diligent in his review.
- Mr. Urukov noted that although the other two economic operating point (EOP) calculations received different treatment, that this was not the case for the Real-Time Lost Cost Economic

Operating Point (LCOP) formula.

Jonathan Paredes confirmed that the IESO reviewed the issue and determined that the equation could be simplified as it was applicable to all dispatchable generators, and that a separate variable generator equation was not required.

On a motion moved by Robert Reinmuller, the Technical Panel unanimously voted to recommend the market rule amendments for IESO Board approval.

Item 5: Ramp Rates for Battery Energy Storage System Facilities

Tim Lam outlined the IESO's responsibilities as a balancing authority, the impact of fast-ramping battery resources on Area Control Error (ACE), and the rationale for introducing a ramp-rate requirement for battery facilities responding to five-minute dispatch instructions. Mr. Lam noted that Ontario currently has more than 1,100 MW of dispatchable battery resources in service and expects that installed battery capacity could exceed 3,600 MW by 2030. The associated materials are available on the Technical Panel webpage.

- Mr. Reinmuller asked whether the analysis considered the broader impacts of rapid battery ramping on Ontario's electricity system, including potential effects on transmission and distribution assets. He noted that rapid ramping can affect equipment such as tap changers and static var compensators and sought clarification on whether these broader system impacts were being considered as part of the study, in addition to the impacts on Area Control Error (ACE) and balancing authority obligations.

Mr. Lam responded that the analysis to date has focused on balancing authority obligations and system-wide balancing impacts. He acknowledged that battery ramping may have impacts on transmission assets and other equipment, but these impacts were not part of the current study and could be considered in future work.

- Mr. Reinmuller encouraged the IESO to consider these broader system impacts as part of future phases of the work, and to fine tune the solution within Ontario as needed. He asked within the context of imbalances observed due to fast ramping, whether it was fair to say that during this phenomenon other fast-acting resources that could respond would counteract this effect and offset the resulting imbalances.

Mr. Lam responded that there are a lot of system dynamics, and that other resources with their specific ramp rates follow dispatch instructions to the best of their abilities. He noted that while most dispatched resources simply move toward their assigned dispatch targets, regulation resources respond to over-generation and under-generation conditions caused by system imbalances. Mr. Lam stated that the proposal is intended to address situations where fast-ramping battery facilities create additional imbalances while moving toward their dispatch targets, resulting in increased reliance on mitigation actions such as regulation service.

- Mr. Reinmuller observed that, if no action is taken, other fast-acting resources would continue to compensate for these imbalances and noted that this is a key reason for considering the proposed changes.

Mr. Lam acknowledged this point.

- Mr. Urukov asked for confirmation whether the nomenclature such as "fast-ramping," "spontaneous ramping," and "very fast-ramping" was referring to battery storage resources.

Mr. Lam clarified that, for the purposes of the presentation, references to fast-ramping resources are primarily referring to battery resources. He noted that battery resources are capable of ramp rates that are significantly higher than those of other resources on the system.

- Rob Coulbeck asked whether fast-ramping battery resources had created ACE challenges that resulted in operating reserve activations.

Mr. Lam advised that he was not aware of any instances where battery ramping alone had caused operating reserve activations. He noted that the impacts are generally incremental and tend to resolve as the rest of the system catches up, although there may be circumstances where battery ramping contributes to conditions that require operating reserve activation.

- Mr. Coulbeck observed that repeated dispatches in the same direction over multiple intervals could create sustained over-generation or under-generation conditions.

Mr. Lam agreed that such conditions could occur under certain operating scenarios.

- Mr. Urukov asked whether there could be instances where out of market actions could be required which give rise to make-whole payments.

Mr. Lam noted that operating reserve activations and one-time dispatches can result in make-whole payments when resources are dispatched out of merit.

- Mr. Urukov asked whether the proposed 100 MW-per-minute ramp-rate limit assumes a particular battery facility size and whether the resulting operational impacts would differ depending on the composition of the battery fleet. Mr. Urukov noted that applying the same ramp-rate limit to a single large facility may produce different outcomes than applying it across several smaller facilities.

Mr. Lam confirmed that the impact of the proposed requirement is influenced by the composition of the battery fleet. He explained that the proposed ramp-rate limit would apply at the facility level regardless of facility size. Mr. Lam noted that the 100 MW-per-minute threshold was selected based on operational experience with Ontario's dispatchable hydroelectric fleet, where comparable ramp rates are routinely managed by the IESO. He added that battery facilities and hydroelectric resources share certain dispatch characteristics, making hydroelectric resources an appropriate reference point for establishing the proposed limit.

- Mr. Urukov asked how compliance with the proposed ramp-rate requirement would be assessed and enforced, given that facilities may be physically capable of exceeding the prescribed limit.

Mr. Lam advised that the IESO has begun discussions with its compliance and enforcement teams regarding potential approaches to measuring compliance. He noted that, unlike existing compliance requirements that focus primarily on achieving dispatched energy levels, the proposed requirement would involve measuring the rate at which energy is injected over a dispatch interval. Mr. Lam indicated that additional development work will be required to establish an appropriate compliance framework.

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- Mr. Urukov asked the IESO to consider looking at the Interpretation Bulletin around compliance with dispatch instructions, noting that it is out of date and to some extent could be tied to this ramping issue. He noted that it was probably a good a time as any, and that there could be challenges regarding the interpretation of a deadband and more compliance related aspects around dispatch.

Mr. Lam agreed and noted that compliance deadbands associated with dispatch instructions would need to be considered as part of the development of the measurement and compliance framework for the proposed ramp-rate requirement.

- Dave Forsyth asked whether the generation output foregone as a result of the proposed ramp-rate limit, as illustrated in the example, would result in make-whole payments.

Mr. Lam advised that make-whole payments would not apply in the example presented, as market payments are based on the actual energy injected by the resource. He noted that stakeholders had raised questions regarding potential lost-cost implications associated with the proposed ramp-rate limit and indicated that the IESO had considered this issue as part of its stakeholder discussions.

- Dave Forsyth acknowledged this point.

- Jennifer Jayapalan noted that the additional analysis on potential lost-cost impacts was expected and welcomed the IESO's commitment to further examine that issue. She then raised concerns regarding the complexity of applying the proposed ramp-rate requirement at the facility level, particularly for larger battery facilities comprised of multiple registered resources. Ms. Jayapalan noted that resources within a facility may be dispatched differently due to outages and operating conditions and sought clarification on how market participants would be expected to manage compliance with the facility-level requirement. She also asked whether the IESO had considered aggregation options or additional guidance to support implementation.

Mr. Lam acknowledged the complexity identified by stakeholders and noted that the IESO had previously responded to similar feedback regarding the potential for additional implementation guidance and initiatives that may enable multiple resources to operate under a single registration construct. Mr. Lam advised that he was not directly involved in those initiatives and therefore could not provide a detailed update. However, he noted his understanding that a future phase of the ERP initiative is expected to consider implementation guidance and related issues. He added that, if these matters are not addressed through that work, the IESO would continue to consider them through future implementation activities.

- Ms. Jayapalan acknowledged the response and noted that an interim implementation gap may remain before any future solutions are available. She commented that larger facilities with multiple resources may face significant operational complexity as they come into service and suggested that additional implementation considerations may be required during that transition period.

- Mr. Reinmuller noted that the proposed ramp-rate requirement may create compliance challenges during the transition period, particularly as market participants adapt facility controls

and operating practices to meet the new standard. He suggested that the IESO consider an implementation approach that incorporates reasonable compliance tolerances or bandwidths around the proposed 100 MW-per-minute requirement to reduce the risk of non-compliance findings resulting from minor deviations. He further noted that such an approach could support an orderly transition while allowing market participants time to optimize facility controls and operational performance.

Mr. Lam agreed that these considerations were reasonable and indicated that they should be taken into account as the IESO continues discussions with its compliance and enforcement teams regarding the development of an appropriate compliance framework.

- Margaret Koontz asked how compliance with the proposed requirement would be assessed and whether compliance deadbands would be considered.

Mr. Lam advised that discussions with the IESO's compliance and enforcement team are ongoing and that additional work is required to develop an approach for measuring compliance with the ramp-rate requirement. He acknowledged that existing compliance deadbands would need to be considered.

Other Business

Mr. Urukov raised the need to review the existing interpretation bulletins related to compliance with dispatch instructions, noting that some guidance documents pre-date the Market Renewal Program. Discussion highlighted the potential benefit of reviewing those bulletins in light of ongoing work related to battery ramp rates, compliance requirements, and dispatch performance.

Adjournment

The meeting adjourned at 10:46 a.m.

The next regular TP meeting will be held on December 1, 2026.

Action Item Summary

Date	Action	Status	Comments

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