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**JUNE 29, 2022**

# Transmission-Distribution Coordination Working Group (TDWG) – June Meeting

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# Today's Agenda

- Feedback summary (IESO)
- DER Market Vision Project Update (IESO)
- Distribution Override Illustration (EPRI)
- Break
- Outages (IESO)
- Market Renewal Program (IESO)

# TDWG Member Feedback

Are there any suggestions to improve the working definition of Transmission-Distribution (T-D) interface?

## Feedback

A fixed definition should be established, and reflected in IESO market rules and regulatory documents (e.g. distribution system code).

Clarity sought around the boundary of the “IESO controlled grid” as current definition implies that the IESO has visibility into all substations connected to the transmission system.

## IESO Response

The working definition of T-D interface is intended to support the TDWG’s discussions. If a formal definition is needed in the IESO Market Rules, it will be developed as part of the Distributed Energy Resource (DER) Market Design Project (following the DER Market Vision Project). The IESO will capture the potential need for a T-D interface definition in the TDWG’s reporting (i.e. the covering memo noted in the forthcoming slides).

Thanks – there are a couple of slides further in this deck revisiting this issue for additional discussion.

# TDWG Member Feedback

What communications take place between LDCs and third party aggregators in real-time/near real-time today, if any?

## Feedback

## IESO Response

For participants in local demand response programs, local distribution company (LDC) provided information includes day-ahead standby notices, and activation notices on days of a demand response event (at least 2-hours before the event). Real time instructions are not provided. LDC do not deal with third party aggregators, but rather with the contracted DER service providers who operate individual DER sites.

Thank you for this feedback.

Noted that activation notices are provided at least 2 hours before the event.

Noted that LDCs do not currently deal with third-party aggregators.

# TDWG Member Feedback

Any comments on the coordination models proposed to be explored in the TDWG?

## Feedback

## IESO Response

Clarity sought on how the IESO views competing priority of services between the Independent System Operator (ISO) and Distribution System Operator (DSO) and whether that priority would be integrated into market rules or Ontario's regulatory framework.

Generally, rather than viewing it as "competing priority", we are viewing it as sequencing of decision making needed to ensure reliable processes for both the IESO and DSOs. Furthermore, in some circumstances a DER's operation could be simultaneously beneficial at the distribution and transmission levels and so would not involve "competing priority" per se.

Under the Total DSO Model, the DSO should have discretion (i.e. depending on DSO system constraints, economic cost-effectiveness, contractual arrangements and system conditions) regarding how to execute an ISO dispatch instruction, rather than just direct relay to DERs. In other words, the ISO and DSO would agree to an exchange of services, and the DSO would determine the optimal solution to deliver the solutions. The ISO relationship with the DERs would be limited.

Noted. In such an approach, there may be a need for DSOs to provide transparency into how they disaggregate wholesale market schedules/dispatches.

Furthermore, and as we expect to explore further in today's and future TDWG sessions, it may be advisable for DSOs to assess any constraints on their systems, contractual arrangements, etc. in advance of the IESO's market processes, such that the DSOs' needs are captured as much as possible in the wholesale market schedules/dispatches.

# TDWG Member Feedback

Any comments on the coordination models proposed to be explored in the TDWG?

## Feedback

## IESO Response

Clarity sought on the term “Dual Participation model”, which refers to the same DER participating in two systems. Has the term been scoped too narrowly? Wouldn’t the Total DSO model also be considered ‘Dual Participation’ then, given participation at two levels of the system?

We agree that the labels/terms are not perfect and can cause confusion. We’re open to suggestions for how to change these, but also note that the usage of these terms are somewhat established already. One way to think about the terms “Dual Participation” and “Total DSO” is from the perspective of the DER participant. In “Dual Participation”, the DER participant has two interfaces and participates in two markets/service provision opportunities. With “Total DSO”, the DER participant has one interface for the totality of the service provision opportunities.

Suggestion to examine the coordination protocols to be developed as part of Toronto Hydro’s Dual Participation Pilot under the OEB/IESO Joint Targeted Call.

To manage the scope of the work as part of the TDWG, we intend to investigate the Total DSO and Dual Participation models (as the IESO describes/defines these). We are happy to work with the Toronto Hydro team to help adapt the conceptual protocols developed as part of the TDWG for Toronto Hydro’s approach in their Joint Targeted Call project.

# TDWG Member Feedback

Any feedback on the Entegrus T-D Coordination Considerations presentation?

## Feedback

## IESO Response

We liked the term “Distribution-Distribution (D-D) Interface” that Entegrus used. As mentioned by Entegrus, most LDCs are connected to the system by a “D-D Interface”, rather than the “T-D Interface”. We suggest that the IESO adopt this into the coordination protocols and create a definition for “D-D Interface”.

The IESO agrees that four party coordination should be investigated for DER override procedures. However, for coordination of DERs providing services to both the distribution system and the wholesale market, the focus will at this time be on protocols for providing services to the IESO and one distribution-level entity (i.e. host or embedded distributor).

# TDWG Member Feedback

Do EPRI's scenarios and methodology for the DER Scenarios & Modelling Study ("Study") make sense? Any suggestions?

## Feedback

## IESO Response

What time periods will the Study consider (e.g. all dispatch timeframes from Day-Ahead, to pre-dispatch, to real-time operation?)

Yes, that is correct.

Under distribution non-wires alternatives (NWA) (import congestion), how does EPRI intend to assess whether DERs can avoid conventional upgrades while maintaining normal system conditions? Will EPRI provide an example based on LDC system operations and future constraints?

The DER Scenarios & Modelling Study will make use of steady-state power flow modeling to assess adequacy to serve distribution load and deliverability to the T-D interface under a number of scenarios that would be expected when DERs are providing services at the distribution level as NWAs and also in the wholesale market. Example IEEE distribution systems/feeders with constraints will be provided.

Can EPRI provide further details on the difference between distribution contingency applications and distribution operating reserve?

Using DERs as distribution operating reserve could be an additional, useful addition to existing distribution contingency approaches, such as reconfiguration/load transfers.

# TDWG Member Feedback

Do EPRI's scenarios and methodology for the DER Scenarios & Modelling Study make sense? Any suggestions?

## Feedback

## IESO Response

Under market offer and coordination analysis, are only market participation functions envisioned, or will contractual arrangements for DSO services be considered?

The study envisions a distribution non-wires alternative initiative being broken down into energy, reserves, and capacity services. The study does not prescribe that these are secured using "market" functions. These services could be secured as part of contractual arrangements or other approaches. The study does however contemplate a wholesale market that DERs are being offered into (directly by the DER participants or by a third-party aggregator).

It was noted that the Study does not consider end-customer use of behind-the meter (BTM) DERs (the majority of which are dispatchable). Suggestion for the Study to consider customer need for these resources, and balance that need against LDC/IESO need for these DER services at the bulk system or distribution level.

The study is making the assumption for now that any BTM DER do not consider customer use of the DER so as to simplify the simulated energy amounts per asset in response to NWA/market signals. This assumption is meant for bounding project scope and would be appropriate to address, either in simple terms within this project or in future research.

# TDWG Member Feedback

## General Comments/Feedback

### Feedback

### IESO Response

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Clarification is sought on the TDWG's core deliverable with regards to coordination protocols.

We have laid out additional details for the deliverable in forthcoming slides.

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Future meetings should be associated with clear deliverables and agenda, and IESO should establish draft topics per meeting for members to prepare.

We have laid out additional details for future meetings in forthcoming slides.

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Explore reliability agreements between a DSO and DER as part of the T-D coordination protocols and not rely purely on market signals or dispatch logic. Depending on the provisions in the reliability agreement, priority of services could be clearly laid out including opportunities to optimize services for both distribution and wholesale markets.

The IESO has proposed an analysis framework, where the DERs' service is broken down into energy, reserves, and capacity services, which could be secured and arranged in a variety of ways. This analysis framework is not intended to be prescriptive. Other ways of categorizing and presenting services can be mapped back to this analysis framework. For instance, DERs participating in net metering can be described as providing energy and capacity services.

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# Working Definition for T-D Interface

- T-D Interface (working definition): the physical locations (e.g. structures, equipment, etc.) at which the IESO-controlled grid and the distribution systems interconnect
  - ~~— E.g. typically at a major substation that reduces the voltage level as the electric topology transitions from networked to radial~~
- IESO Market Rules - Chapter 11 Definitions: *IESO-controlled grid* means the transmission systems with respect to which, pursuant to operating agreements, the IESO has authority to direct operations
- IESO Market Rules: *distribute*, with respect to electricity, means to convey electricity at voltages of 50 kilovolts or less

# Relevant Language from Uniform Transmission Rates

- In the context of a working definition for T-D interface, there is an informative definition in the [Ontario Uniform Transmission Rate Schedules](#):

The Transmission Delivery Point is defined as the transformation station, owned by a transmission company or by the Transmission Customer, which steps down the voltage from above 50 kV to below 50 kV and which connects the customer to the transmission system.

- For the purpose of this discussion, the “customer” of the transmitter referenced in the definition above is the host distributor

# TDWG Deliverables

- Concept-level Dual Participation and Total DSO coordination protocols, addressing distribution “override” and T-D services “cross-participation” rules
  - Informed by “cross-participation” rules for distribution services and wholesale market developed as part of DER Scenarios & Modelling Study
  - Format of conceptual coordination protocols the IESO will draft informed by:
    - ESIG’s example of DER De-Rate Notification (discussed today)
    - Joint Utilities of New York’s [DSP\\* Communications and Coordination Manual](#) (will be discussed at the next TDWG session)
  - Will include a covering memo to summarize the TDWG discussions/process, capture considerations, and outline future potential work

# Past TDWG Meetings

- Meeting #1: Introduction to TDWG, introduction to T-D coordination, overview of DER Scenarios & Modelling Study
- Meeting #2: T-D interface working definition, WG feedback discussion, DSO models in scope, additional detail re: DER Scenarios & Modelling Study
- Meeting #3 (today): ESIG “override” example, IESO outage processes, and timing of relevant participant-facing IESO Market Renewal processes

# Q3/Q4 TDWG Meeting Topics

- Utilities of New York's draft [DSP Communications and Coordination Manual](#)
- Draft T-D "cross-participation" rules for energy and operating reserves
- Mapping non-wires alternatives to energy, reserve and capacity services
- Considerations for sequencing DER selection for distribution/wholesale services
- Draft ON coordination protocols for Dual Participation and Total DSO models
- Draft results for the DER Scenarios & Modelling Study

Anticipating 3-4 additional TDWG meetings in remainder of 2022

# Two Components of T-D Coordination

The day-ahead/near real-time T-D coordination problem can be categorized into:

- Distributor “override” of wholesale market schedules/dispatch
  - i.e. DER/DER aggregator operation is infeasible due to distribution reliability impacts
  - This is one of the main topic of today’s TDWG session
- DERs “stacking” and providing both distribution- and wholesale-level services
  - To enable, “cross-participation” rules needed
  - Sequencing of distribution-level services decision and wholesale market processes may be needed

## Feedback Questions (1/2)

- Any suggestions for additional topics needed in order to develop the TDWG deliverable (which was described in greater detail today)?
- *What existing/new processes could distributors use to communicate distribution "override" conditions to customers with DER facilities and DER aggregators that are participating in the wholesale market?*
- The ESIG example of DER De-Rate Notification is expected to inform the IESO's drafting of conceptual T-D coordination protocols for discussion at a future TDWG session. Any considerations you advise we bear in mind?

## Feedback Questions (2/2)

- Can the approach described in the ESIG example of DER De-Rate Notification be extended (with tweaks/additions) to address coordination of DERs “stacking” distribution and wholesale services?
- *The conceptual T-D coordination protocols for enabling DERs to “stack” services may involve the distribution-level decision to use DERs for NWAs taking place in advance of the IESO’s day-ahead market and real-time market processes. How would this align with distribution-level processes/needs?*

## Next Steps

- Please use the feedback form found under the June 29 entry on the [TDWG webpage](#) to provide feedback and send to [engagement@ieso.ca](mailto:engagement@ieso.ca) by July 20
- The next TDWG meeting is expected in August/September and will focus on the Joint Utilities of New York's draft DSP Communication and Coordination Manual as well as draft "cross-participation" rules for energy and reserve as part of distribution services and the wholesale market
- Seeking presentations by LDCs for the next TDWG session on the italicized feedback questions on the previous slide