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Transmission-Distribution Working Group #6

Feedback – Draft T-D Coordination Protocols

February 27, 2023

Leading through Innovation

- The IESO has taken a lead on exploring various approaches to meet the province's reliability needs, collaborating with LDCs on innovative initiatives such as the IESO York Region Demonstration project that successfully tested Total DSO model, and creating a forum that drives in-depth engagement to establish T-D coordination protocols
- IESO & LDC common goals:
  - Clean, reliable, efficient and customer-oriented electricity grid
  - Unlocking all values DERs can offer for local, regional and provincial system needs including peak demand management, ancillary services and other reliability services
- Through active engagement, in the spirit of collaboration and soliciting constructive feedback, we are happy to share our observations on the conceptual T-D coordination protocols on November 9, 2022

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OBSERVATIONS ON PROPOSED APPROACH

Area	Detail
Communication	• The obligation of communication mechanisms/pathway relies solely on DERs or DER(A)s • Require further clarification on integration pathway between DERs and LDCs (implication is multiple integrations or need for each LDC to build their own market platform) • DER registration process would need to be further clarified • Need to further clarify communication timeframes and information sharing process
Analysis	• The analytical capabilities required by the LDCs to facilitate the necessary assessments and coordination does not currently exist. These will require significant upgrade to data, operational, planning and metering tools, re-vamping or new processes and hiring of additional staff • Furthermore, there are alternative pathways that reduce the computational requirements for LDCs without compromising coordination • Current approaches present some challenges in terms of scalability and do not necessarily account for the creation of additional grid services by LDCs and the potential of third-party players procuring services from DERs
LDC Jurisdiction	• The definition of “unplanned” operations or “override” rights is limiting and does not account for the level of complexities LDCs face in operating their large and diverse networks • LDCs are the only entities with the obligation to maintain the reliability and safety of distribution networks and the required visibility into the dynamic operations of their network
Remuneration	• Clarity on DER settlement and utility cost remuneration to enable LDC to undertake the responsibilities outlined

Considerations – Distributor's Perspective

- Scalable information sharing and communication mechanisms
- LDCs need to maintain their ability and independence to operate their distribution networks (ex. dispatching) as they are the only entities with the obligation to maintain the reliability and safety of distribution networks and the required visibility into the dynamic operations of their network
- Clear view on the mechanisms for LDCs to recover their costs for supporting the T-D coordination
- Identifying the most efficient computational requirement for LDCs

Thank you

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Appendix

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Pre-step - operational planning: LDC informs DER(A) of any expected limits to DER(A) operation

Timeframe: ongoing and in accordance with IESO planned outage management requirements/timeframes

From: **DER(A)/LDC**

To: **LDC/DER(A)/IESO**

Requirements:

- **DER(A)** notifies LDC about any planned outage that impacts their distribution NWA service.
- **DER(A)** notifies IESO about any planned outage (with duration) that impacts their participation in the wholesale market, including any planned DER(A) outages due to distribution system planned outages.
- **LDC** communicates any planned distribution outages to the DER(A) in a timely manner. Depending on the distribution outages, LDC may only permit a DER(A) (or individual DER contributors) to operate up to a maximum capacity/quantity*.
  - If the DER(A) involves an embedded LDC and host LDC, then the outage information of both LDCs will need to be communicated to the impacted DER(A).

* LDCs will need to assess the operation of DER(A) (and individual DER contributors) at maximum capacity from a distribution safety and reliability perspective as part of the DER(A) registration and approval process.

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1. LDC required to make public hosting capacity limits (HCL), capability that does not exist:
   - Technical issues encountered when service providers are on the same feeder (LDC to determine allocation)
   - Inefficient for DER to communicate LDC outages to IESO; LDCs and IESO best positioned to exchange grid needs and impacts
   - The mechanism/criteria by which the LDC determines operation limits for distribution connected resources are the purview of the LDC
2. There is a requirement of individual integration with DERs or creation of LDC marketplace (capability that currently does not exist)

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DAM - Step 1: LDC releases distribution service schedule

Timeframe: Prior to the IESO's DAM submission deadline (e.g., by 08:00 AM, day-ahead)

From: **LDC**

To: **DER(A)**

Requirements:

- **LDC** releases distribution NWA service schedule for the next operating day, based on its assessment and identification of distribution service needs
  - **LDC** may also communicate updated limits to DER(A) permissible maximum capacity/quantity based on distribution system forced outages.
- **DER(A)** capacity remaining is permitted to participate in DAM and RTM to provide energy or operating reserve.*
  - However, if the DER(A) (including any contributor DER to a DERA) is providing a short-notice, reserve-type service to the LDC, then it cannot participate in the IESO's wholesale market.

*It is assumed that assessments have been conducted to ensure that simultaneous operation of the DER(A) at maximum capacity would not create any security issue for the distribution system.

1. LDC required to run day ahead analysis (powerflow in the loop) to determine capabilities. Capability that does not currently exist.
2. LDC may limit DER operation for various reasons given its mandate to maintain the reliability and safety of distribution network.
3. Is the LDC required to run markets in similar timeframes as IESO?

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DAM - Step 2: Offer/bid and other IESO dispatch data submission

Timeframe: DAM submission deadline (10:00 AM, day-ahead)

From: **DER(A)**

To: **IESO**

Requirements:

- **DER(A)** submits offers/bids and other dispatch data to the DAM.
- **DER(A)** submission has two parts:
  1) If applicable, distribution service quantity with a "LDC-directed" offer/bid (e.g., "floor price" offer)
  2) The remaining DER(A) capacity with price-quantity pairs
- **DER(A)** offers/bids must also abide by any limits to the permissible maximum DER(A) capacity/quantity communicated to the DER(A) participant as part of previous steps.

1. How will the IESO contribute to the LDC-directed offer/bid?

* "LDC-directed" offers/bids would be considered as "must operate" for distribution NWA purposes. An offer/bid at the "floor price" will ensure that the expected DER(A) operation is included in the IESO's DAM schedules.

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DAM - Step 3: DAM results are posted

Timeframe: 13:30, day-ahead

From: **IESO**

To: **DER(A) & potentially LDC**

Requirements:

- **IESO** communicates DAM schedules for the next operating day to DER(A).
- **DER(A)** might communicate their DAM results to the LDC, if required by the LDC.
  - If there is a host LDC involved, DAM results could be shared with it as well, if required.
  - In the enhanced models being explored in the DER Market Vision Project, the IESO could communicate DAM results directly to LDCs in addition to the DER(A).
- **DERA** manages/communicates the DAM schedule among their contributor DER, as appropriate.

1. How or through which mechanism will the DER communicate to the LDC? Capability currently does not exist
2. Both host and embedded LDCs would require this information
3. The enhanced model does not contemplate IESO – LDC communication. Untimely communication could jeopardize grid operations

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RTM - Step 1: LDC releases updated distribution service schedule

Timeframe: In advance of IESO's 2 hour mandatory window (e.g., 3 hours before the dispatch hour)

From: **LDC**

To: **DER(A)**

Requirements:

- **LDC** may ask for additional or reduced energy from the DER(A) to address the most updated distribution service needs.
  - **LDC** may also communicate updated limits to permissible maximum DER(A) capacity/quantity based on distribution system forced outages.
- **DER(A)** capacity remaining is permitted to participate in wholesale market to provide energy or operating reserve.
  - However, if the DER(A) (including any contributor DER to a DERA) is providing a short-notice, reserve-type service to the LDC, then it cannot participate in the IESO's wholesale market.

1. LDC required to conduct RTM analysis (power flow in the loop) to determine capabilities (Capability currently does not exist)
2. LDC may limit DER operation for various reasons not just forced outages
3. Is the LDC required to run markets in similar timeframes as IESO?

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RTM - Step 2: Offer/bid and other IESO dispatch data submission

Timeframe: IESO's mandatory window deadline (2 hours before the dispatch hour)

From: **DER(A)**

To: **IESO**

Requirements:

- **DER(A)** update/submit offers/bids in the RTM*
- **DER(A)** submission has two parts:
  1) If applicable, distribution service quantity with a "LDC-directed" offer/bid (e.g., "floor price" offer)
  2) The remaining DER(A) capacity with price-quantity pairs*.
- **DER(A)** offers/bids must also abide by any limits to the permissible maximum DER(A) capacity/quantity communicated to the DER(A) participant as part of previous steps.

* According to the MRP rules, there are some restrictions around increasing the energy offer quantity (i.e., the Availability Declaration Envelope (ADE) requirement).

1. LDCs do not have the capability to determine DER permissible limits. New tools and processes will be required.

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RTM - Step 3: IESO dispatches all resources at each market node

Timeframe: Every 5-minute real-time dispatch interval

From: **IESO**

To: **DER(A) & potentially LDC**

Requirements:

- **IESO** communicates RTM dispatch instructions and advisory dispatch information to DER(A)*.
- **DER(A)** might communicate RTM dispatch instructions to the LDC, if required by the LDC.
  - If there is a host LDC involved, RTM results could be shared with it as well, if required.
  - In the enhanced models being explored in the DER Market Vision Project, the IESO could communicate RTM results directly to LDCs in addition to the DER(A)
- **DER(A)** manage/communicate the RTM dispatch among their contributor DERs, as appropriate.

*Since LDC's distribution service request is still active and has been submitted as "LDC-directed" offers/bids, IESO's dispatch will include distribution service NWA portion plus any additional awards in the RTM.

1. Why are DERs communicating their commitment to LDC not the IESO? How or through which mechanism will the DER communicate to the LDC? (Capacity that does not exist)
2. LDC should be responsible for dispatching all assets within its service territory to facility emergency operations and ability to manage system operations
3. LDC would need visibility into DER's output to ensure they are delivering as per the permissible maximum, since any large deviations from allowable maximum pose a risk and can cause issues for the LDC
4. It is imperative for IESO and LDCs to be able to communicate with each other directly and not through DERs

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