

ESIG's Illustration of DER De-Rate Notification (1/5)

The following is an illustration for how an aggregator could notify the ISO about reduced capability using CAISO market timelines, terminology, processes, etc. and is sourced from the ESIG report [DER Integration into Wholesale Markets and Operations](#).

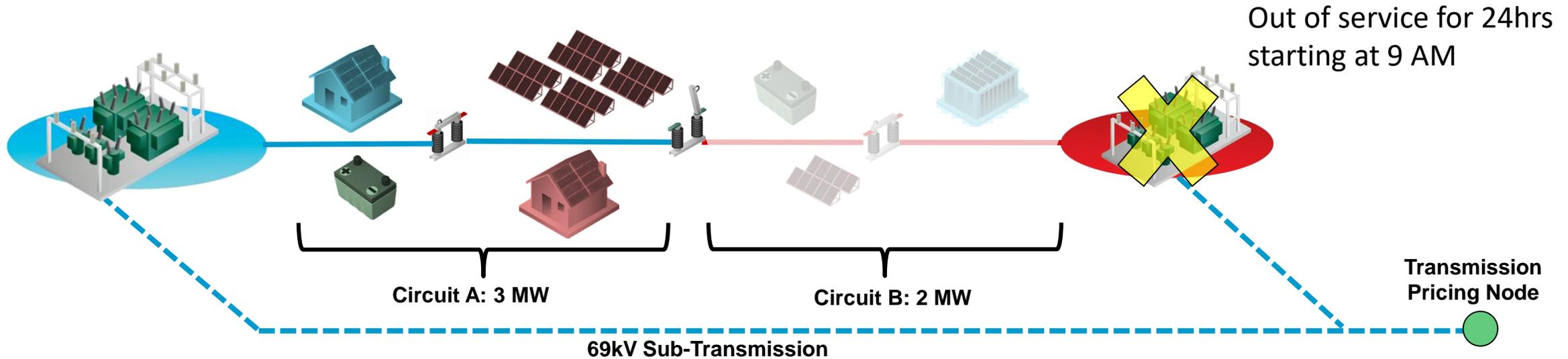
- Note: This example is **NOT** consistent with IESO terminology, timelines, processes, etc. but is being presented as a starting point for approaching the outage/de-rate coordination process in Ontario

The scenario is as follows: The aggregator has a DER aggregation (DERA) with 5 MW capacity (maximum power injection) composed of individual DERs distributed over two distribution circuits within a single transmission-distribution interface (PNode). Circuit A hosts 3 MW and circuit B hosts 2 MW of the DERA capacity. At 9 am Monday, the DSO informs the aggregator of an immediate transformer problem that has taken out distribution circuit B, preventing 2 MW of the DERA capacity on that circuit from operating. The DSO expects the problem to continue for the next 24 hours until circuit B can be restored.



Illustration is verbatim from the source: ESIG's [DER Integration into Wholesale Markets and Operations](#) report

ESIG's Illustration of DER De-Rate Notification (2/5)



- The example cites a transformer problem that removes circuit B from service for 24 hrs, but could be any problem/configuration that requires the DER on circuit B to disconnect.
- The example states that the entire aggregation is associated with a single transmission pricing node but could be easily adapted to a geographically broad case as well.
- The example assumes that aggregator bid in the day-ahead market for Monday and was awarded all 5 MW for all 24 hours of the day.
- The example uses an emergent outage but could be applied to a planned outage as well.

ESIG's Illustration of DER De-Rate Notification (3/5)

We will assume the following time line of the CAISO spot market:

- Day-ahead (DA) offers for Tuesday must be submitted for all 24 hours by 10 am on Monday.
- Real-time offers must be submitted by 75 minutes prior to each operating hour (T-75).
- Outage/derate cards must be submitted immediately whenever the event occurs.

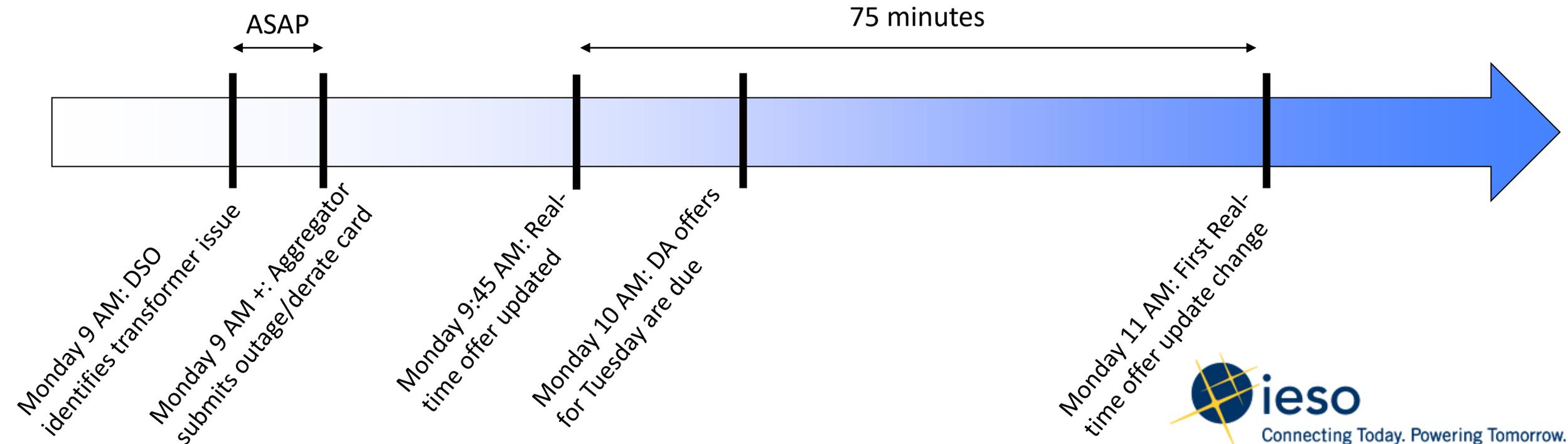


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ESIG's Illustration of DER De-Rate Notification (4/5)

The following steps describe how the aggregator would use the DSO constraint information to modify its market offers and inform the ISO of its reduced capacity.

1. The aggregator immediately submits an outage/derate card to the ISO indicating DERA capacity reduction from 5 MW to 3 MW for HE10 (hour ending at 10 am) Monday through HE09 Tuesday.
2. The aggregator structures its day-ahead market offers for the DERA for Tuesday to reflect maximum 3 MW for HE01-09 and maximum 5 MW for HE10-24 (based on the expected 24-hour duration of the circuit B outage).
3. The aggregator structures its real-time market offers for Monday HE12-24 based on maximum 3 MW capacity. This may involve the aggregator buying back portions of the DERA's day-ahead schedules (which cleared in Sunday's day-ahead market) for hours where they exceed 3 megawatt-hours (MWh).



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ESIG's Illustration of DER De-Rate Notification (5/5)

4. The ISO does not receive new real-time offers for 5-minute intervals from 9:10 am until 11:00 am, but the market optimization knows from the outage/derate card that the DERA's maximum output is 3 MW, so it will not dispatch the DERA for more than 3 MW capacity in any interval.

5. For the interval from 9:00 am to 9:10 am the ISO does not perform any new market optimization, so its previously issued dispatches to the DERA would reflect 5 MW capacity. Thus, the DERA may fall short of its day-ahead schedule or real-time dispatch. The imbalance on the ISO system is managed by regulation (automatic generation control) and may subject the DERA to uninstructed deviation charges.



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