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Improving Accessibility of Operating Reserve

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Agenda

- Operating Reserve (OR) – Review
- Stakeholder Engagement
- What is the OR accessibility Issue? What is its impact?
- Proposed Solution
- Next Steps

Operating Reserve (OR)

- Having enough energy to meet demand is critical for the IESO, and other system operators, to maintain a reliable supply of energy. The IESO schedules sufficient supply to meet demand, while also scheduling Operating Reserve (OR) supply with the recognition that unplanned events can upset the supply and demand balance at any moment. Such events (known as contingencies) may include:
  - A sudden loss of generation
  - An unexpected increase in demand
  - The loss of a transmission line, which results in supply becoming unavailable

Operating Reserve (continued)

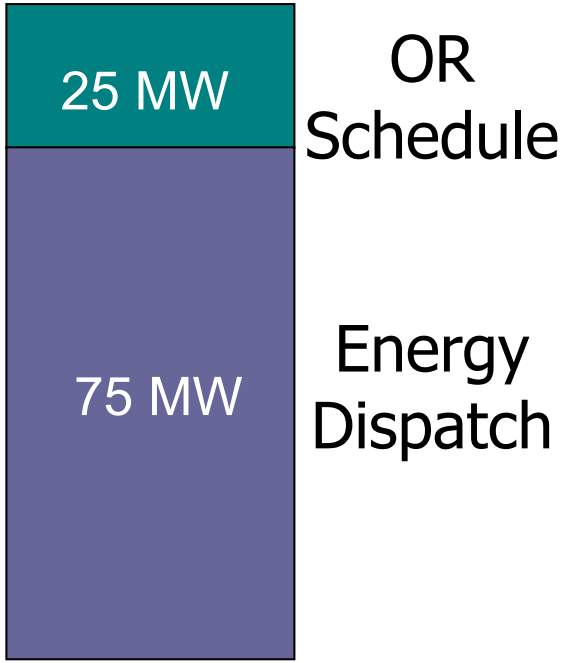
- The IESO is required by industry standards to schedule sufficient OR such that we can restore the supply/demand balance following a contingency event on the system within prescribed timelines
- When the IESO needs to activate OR, resources are selected to provide additional supply based on the lowest cost of that incremental energy

Operating Reserve Activation

- An ORA is sent as an energy dispatch instruction where a supplier is dispatched up or a consumer is dispatched down. The target level of the dispatch is based on their energy dispatch prior to the activation
- During an OR activation (ORA), selected OR participants must provide their incremental energy supply within the time period for the OR that has been activated:
  - If activated for 10-minute reserve, a facility has 10 minutes to provide the energy
  - If activated for 30-minute reserve, a facility has 30 minutes to provide the energy

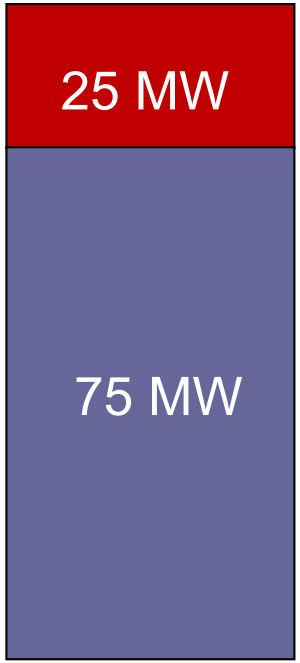
ORA Example – Dispatchable Generators

- Generator offered:
  - 100 MW of energy
  - 100 MW of 10-minute OR
- Scheduled to provide 75 MW of energy and 25 MW of 10-minute OR



ORA Example – Dispatchable Generators

- If activated for all 25 MW of OR, generator receives:
- An energy dispatch instruction increasing their production from 75 MW to 100 MW
- A 10-minute OR schedule of 0 MW
- The IESO receives the change of 25 MW energy from the generator

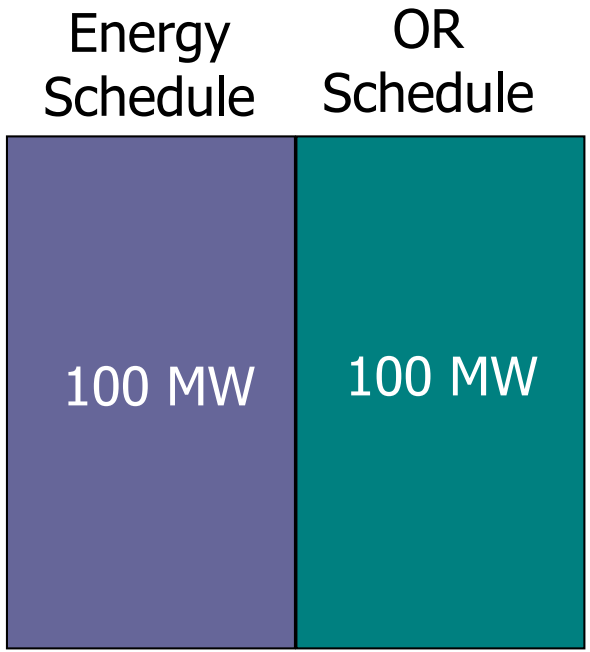


Energy schedule becomes 100 MW

OR Schedule is then 0MW

ORA Example – Dispatchable Loads (DLs)

- DL offered:
  - 100 MW of energy
  - 100 MW of 10-minute OR
- Scheduled to 100 MW of energy and 100 MW of 10-minute OR



ORA Example – Dispatchable Loads (DLs)

- If activated for all 100 MW of OR, DL receives:
  - An energy dispatch instruction moving them from 100 MW to 0 MW
  - A 10-minute OR schedule of 0 MW
- The IESO receives the change of 100 MW energy from the DL

Energy Schedule	OR Schedule
0MW	0 MW

Stakeholder Engagement

- Launched Improving Accessibility of OR stakeholder engagement in Q1 2019
  - Five stakeholder engagement sessions have been held to date
  - The design of the settlement claw-back and the dispatch tool change were stakeholdered in most recent Stakeholder Engagement (SE) session (May 28, 2021)
  - Market rules for the proposed changes were also presented at the May 28 SE session

What is the Issue?

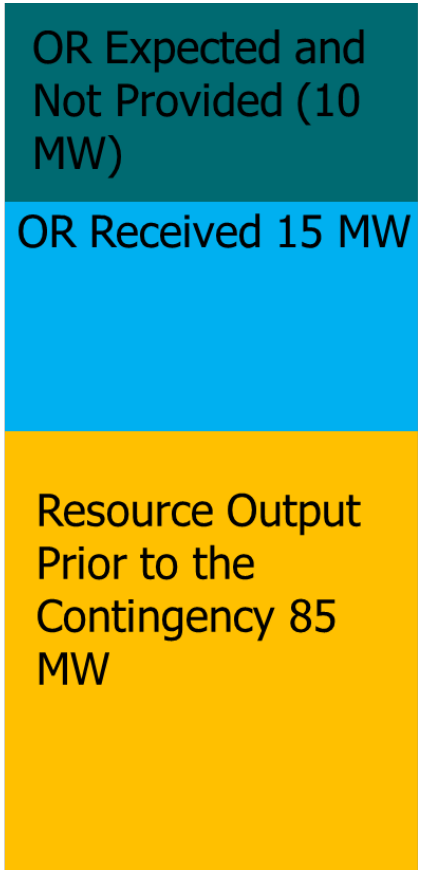
- In some cases the IESO cannot access the full amount of scheduled OR
  - The amount of energy provided following an ORA is affected by the actual production/consumption of the resource preceding the ORA
  - Deviations from the dispatch instruction preceding the activation result in differences between the amount of OR scheduled and the energy that is actually provided when OR is activated

Example: Dispatchable Generator

- Scheduled to 75 MW of energy and 25 MW of 10-minute OR
- Activated for 25 MW of OR
- Generator receives an 100 MW ORA energy dispatch

Example: Dispatchable Generator

- Output prior to the contingency is 85 MW
  - Currently dispatch is to 75 MW but operating over dispatch within compliance deadband
  - Output at the time of the activation =85 MW
  - OR activated = 25 MW
  - OR received = 15 MW
  - Generator reached 100 MW output but only increased generation by 15 MW
- OR expected but not provided = 25 -15 = 10 MW



Market Surveillance Panel Recommendation

- The Market Surveillance Panel (MSP), in its May 2017 report, made the following recommendation:

The IESO should take steps to ensure that dispatchable loads are only compensated for the amount of operating reserve they were capable of providing in real-time. More fundamentally, the IESO should explore options for ensuring unavailable OR is not scheduled in the first instance.

- During the IESO's examination of the issue, it was identified that the OR accessibility issue is not limited to DLs; it applies to all dispatchable resources

Reliability Concern

- Per industry standards the IESO must re-balance the system within 15 minutes of a contingency event
- Not seeing the change in energy during an ORA commensurate to the amount of OR activated impedes the IESO's ability to meet those standards and maintain reliability
- In order to maintain reliability, the IESO may be forced to take additional actions such as activating more OR than the contingency, which comes at an additional ratepayer cost

Proposed Solution

- Considering stakeholder feedback and inputs provided by various subject matter experts across the organization, the IESO recommends the following solutions to address the OR accessibility issue:
  - **Settlement claw-back:** Implement market rule changes to enable an automated settlement process to claw back payments for OR that is not able to be activated
  - **ORA dispatch tool change:** Modify the IESO dispatch tool to account for actual output/consumption in determining the ORA dispatch target

Proposed Solution- Dispatch tool change

- The logic for ORA dispatch instructions for dispatchable generators will be determined as:
  - The maximum of either the resource's output at the time of the ORA or the energy dispatch for the end of the interval, plus the OR being activated up to the resource's high operating limit. No supplier of OR will be dispatched to a value beyond its physical capability
- This modification will improve the IESO's ability to access OR while also addressing concerns raised by stakeholders

*Detailed examples can be found in Appendix

Proposed Solution- OR Settlement Claw-Back

- For each class of OR, the claw-back will be calculated as the difference between the relevant OR standby payment paid and the OR standby payments calculated based on OR that could be activated
- The proposed claw-back helps ensure the IESO only pays for OR that could be activated if needed

Next Steps

- The IESO has included the redlined market rules in the May 28 SE presentation
- The IESO is accepting stakeholder feedback on the redlines until June 18, 2021
- IESO will work to consider feedback and incorporate comments as appropriate and post responses on the Improving Accessibility of Operating Reserve SE page
- Draft market rules are targeted for review at the July TP meeting

Summary of Draft Market Rules

Rules	Market Rule Chapter
Market Rules amended to clarify the IESO's ability to dispatch all resource types that are participating in the OR market	Chapter 7
Market Rules are to be amended to allow the IESO to calculate ORA dispatch based on resources' output/consumption at the time of ORA	Chapter 7
Market Rules will make clear that the IESO may take action to remove the offers from registered facilities that consistently fail to produce energy or reduce energy withdrawals when called upon.	Chapter 7

Summary of Draft Market Rules

Rules	Market Rule Chapter
Market Rules are to be amended to allow the IESO to automate the OR settlement claw-back	Chapter 7
New OR claw-back formulas and OR claw-back charge types to be added	Chapter 9
Market Rules are to be amended to allow the IESO to claw-back unwarranted CMSC when a resource failed to maintain unused generation (or load reduction) capacity equal to or greater than their total amount of scheduled operating reserve.	Chapter 7

Appendix: ORA Dispatch Instructions Examples

Appendix: ORA Dispatch Instructions Examples Scenario 1: Generation Resource with Headroom

- OR schedule =50 MW, 50 MW of OR is activated at 10:07, Max capability of the resource is 200 MW

A	B	C	D	E	F	G	H	I
	Max Capability		Energy Schedule 10:05	Output at 10:07 (OR activation)	Energy Schedule 10:10	Exsiting ORA Target	Proposed ORA Target	DIFF
GEN 1	200	Ramping Up	90	95	100	150	150	0
		Under Generating	100	95	100	150	150	0
		Ramping Down	100	90	80	130	140	10
		Over Generating	100	110	100	150	160	10

Appendix: ORA Dispatch Instructions Examples Scenario 2: Generation Resource without Headroom

- OR schedule =50 MW, 50 MW of OR is activated at 10:07, Max capability of the resource is 150 MW

A	B	C	D	E	F	G	H	I
	Max Capability		Energy Schedule 10:05	Output at 10:07 (OR activation)	Energy Schedule 10:10	Exsiting ORA Target	Proposed ORA Target	DIFF
GEN 2	150	Ramping Up	90	95	100	150	150	0
		Under Generating	100	85	100	150	150	0
		Ramping Down	100	90	80	130	140	10
		Over Generating	100	110	100	150	150	0

Appendix: ORA Dispatch Instructions Examples Scenario 3: Dispatchable Loads

- OR schedule = 30 MW, 30 MW of OR is activated at 10:07

A	Max Capability	B	C	D	E	F	G	H
			Energy Schedule 10:05	Consumption at 10:07 (OR activation)	Energy Schedule at 10:10	Existing ORA Target	Proposed ORA Target	DIFF
DL	100	Shutting Down	70	60	50	20	20	0
		Over Consuming	50	60	50	20	20	0
		Increasing Consumption	50	60	70	40	30	10
		Under Consuming #1	70	60	70	40	30	10
		Under Consuming#2	30	0	30	0	0	0

Thank You

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