Replacement Offers

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Introduction

Replacement offers allow participants to revise the offer for one of their generation resources in response to the forced outage of another at the same facility. In this way, the participant can 'replace' the energy that would have been produced by the generator on outage. This Quick Take describes how and when replacement offers can be used.

Background

Replacement offers allow the registered market participant (RMP) for a qualifying generation resource to 'replace' the output of that resource should it go on a forced outage[1] by revising the dispatch data of the replacement resource during the real-time market mandatory window. The mandatory window begins two hours before the start of a dispatch hour and ends 10 minutes before the start of a dispatch hour.

The use of replacement offers is open to the RMP for a generation resource at a hydroelectric facility, a combined cycle plant, an enhanced combined cycle facility or a cogeneration facility. If a resource at such a facility suffers a forced outage, the RMP may revise the dispatch data of a related resource. To qualify as a related resource, the replacement resource must:

- Have the same RMP,
- Have the same metered market participant,
- Not have committed its capacity to an external control area, and
- It must be at the same facility. In the case of:
    - A hydroelectric facility, it must be able to use the water of the generation resource on forced outage without delay.

[1] A forced outage means an unanticipated intentional or automatic removal from service of equipment or the temporary de-rating of, restriction of use or reduction in performance of equipment. For purposes of replacement offers, a forced outage is an outage request submitted to the IESO's outage management system with a "FORCED" or "URGENT" priority code.

- A combined cycle, enhanced combined cycle or cogeneration facility, it must be able to replace the contribution of the resource on outage to the steam supplied to the steam turbine.

It's important to note that replacing the offers of one resource with another does not transfer the day-ahead schedules or day-ahead or real-time commitments of the resource on outage to the replacement resource. It simply revises real-time market offers.

Why are hydroelectric generating stations able to use replacement offers?

Some hydroelectric generating stations have more than one generation resource at the same site. Separate offers are required for every delivery point to the grid at these multi-resource stations. When one of these resources suffers a forced outage, it can no longer use water to make electricity. If its forebay is full, or if it does not have a forebay, it has to let water bypass the plant (called 'spilling'). When a plant spills, it loses the opportunity to use that water to generate electricity.

For these multi-resource stations, an alternative to spilling is to increase the production of another resource that draws water from the same source (i.e., forebay). Having replacement offers allows for the replacement resource's dispatch data to be changed within the mandatory window, allowing for a relatively quick change in output. Without replacement offers, any change would have to be made two hours into the future, i.e., outside the mandatory window.

Why are combined cycle facilities able to use replacement offers?

Combined cycle generation facilities produce electricity using combustion turbines and a steam turbine. The steam turbine is driven by steam created from waste heat from the combustion turbines. Each turbine is offered separately if the resources are not modelled as a pseudo-unit[2]. Replacement offers allow for the replacement combustion turbine to be dispatched up much more quickly than otherwise.

Replacement Offer Process

To invoke replacement offers, the RMP for a qualifying generation resource calls the IESO control room and indicates:

- The name of the generation resource that is expected to be unavailable.
- The quantity of energy required to be replaced.
- The name of the generation resource that will supply the replacement energy.
- If the related generation resource is not synchronized, they must notify the IESO of their intention to synchronize it. The IESO will approve if it is determined that synchronization will have no adverse impact on the reliability of the IESO-controlled grid.

[2] A pseudo-unit is a dispatchable generation resource associated with a combined cycle plant that is modeled based on a gas-to-steam relationship between one combustion turbine (CT) generation resource and a share of one steam turbine (ST) generation resource at the same combined cycle plant.

The RMP then submits revised dispatch data for the generation resource supplying the replacement energy:

- No later than one hour after the generation resource experienced the forced outage,
- For the next available dispatch hour, and
- For an amount which is no greater than the amount that was offered on the generation resource experiencing the forced outage.

What happens next?

The IESO will approve the replacement energy offer from the related generation resource, provided there is no adverse impact on grid reliability.

The revised dispatch data will be used for the next hour if it was submitted more than 10 minutes before the end of the hour. If it's submitted less than 10 minutes before the start of the dispatch hour (i.e., after the close of the mandatory window), it cannot be applied until the following hour. For example, if a revised offer was submitted at 10:40, it will apply for the hour starting at 11:00. If it was submitted at 10:55, it won't apply until the hour starting at 12:00.

There will be a period between when revised dispatch data is entered and when the IESO's calculation engine software can use it to determine dispatch instructions. In the interim, the IESO's operators will manually constrain the replacement resource so it can receive appropriate dispatch, unless doing so would adversely affect grid reliability. The replacement resource will be constrained for no more than the amount of energy originally scheduled for the resource its replacing. For example, assume Gen A was producing 20 MW and Gen B 30 MW at the time when Gen A went on outage. Gen B will be constrained on to 50 MW during the period before the revised offers can be processed. The replacement resource will not be eligible to receive a real-time make-whole payment as the constraint will be coded consistent with a SEAL[3] request.

Non-quick start resources are allowed to update their hourly and daily dispatch data in the mandatory window in order to enter a replacement offer, but they are not constrained by the IESO and must be scheduled through normal pre-dispatch and real-time scheduling mechanisms.

What if the forced outage is not expected to last for a full hour?

Revised dispatch data is not required if an outage is expected to last for less than an hour. Instead, call the IESO Control Room and request to increase the output of the related resource. The IESO will allow it if doing so won't harm grid reliability.

For example, assume a resource has a forced outage at 4:50 which is expected to end by 5:30. It's too late to submit revised dispatch data for the hour between 5:00 and 6:00. Therefore, call the IESO and indicate you want to increase the output of a related resource during the period of the outage. The IESO will evaluate your request as soon as possible and let you know if it can be allowed.

[3] A SEAL request is intended to prevent the resource from operating in a manner that would endanger the safety of any person, damage equipment, or violate any applicable law

Summary

Replacement offers allow hydroelectric and combined cycle natural gas facilities to 'replace' the energy production that would be lost due to a forced outage or forced derate with energy from another resource at the same facility. The IESO's systems will process replacement offers as soon as possible. In the meantime, you can increase the output of the replacement resource, as long as the IESO Control Room approves.

Additional Resources

For more information view the following Market Rule and Manual available on the IESO Market Rules and Manuals library:

- Market Rules, Chapter 7: System Operations and Physical Markets, section 3.3.4.
- Market Manual 4.1: Submitting Dispatch Data in the Physical Markets, section 9.

Contact Us

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