

Service	Eligible Products	Market	Purpose	Response Time	Response Duration	Online Only?	Response Mechanism	Offers	Locational?	Max requirement	At other ISOs	ORDC Key characteristics
Synchronized Reserves	SR (online)	RTM + DAM	Post-contingency response to restore ACE levels	10-Minutes	30-Minutes	Synchronized, but need not be SCED dispatchable	All Call (automated response to spin event; not through RT-SCED)	Soft Cap of \$10 + expected penalty rate	Yes	Most Severe Single Contingency (MSSC) with a potential performance adder	SR (NYISO/MISO/SPP/CAISO); ECRS (ERCOT); TMSR (ISO-NE)	A single step demand curve priced at \$2,100/MWh till SR requirement, and \$0 beyond it
10-Min Ramp/Uncertainty Reserves (RUR) Up	10-Min RUR (Up)	RTM + DAM	Address 10-Min forward net-load ramp up following energy dispatch along with associated uncertainty in the ramp up direction	10-Minutes	1-Hour	Yes + SCED dispatchable	Economically dispatched through RT-SCED at applicable time	\$0 offer in RTM; Soft Cap of \$10 in DAM	Yes	Max(10-Min expected netload up ramp (50/50 forecast) + 95-th percentile ramp uncertainty following SCED target, 0). In this case, a netload down ramp is considered negative	Ramp Capability (SPP/MISO); 5-Min Flexible Ramp Up Product (CAISO)	Downward sloping: priced at ~\$1,900/MWh at expected ramp - 95th percentile uncertainty, \$1,000/MWh at expected ramp, and ~\$100/MWh at expected ramp + 95th percentile uncertainty
10-Min Ramp/Uncertainty Reserves (RUR) Down	10-Min RUR (Down)	RTM + DAM	Address 10-Min forward net-load ramp down following energy dispatch along with associated uncertainty in the ramp down direction	10-Minutes	1-Hour	Yes + SCED dispatchable	Economically dispatched through RT-SCED at applicable time	\$0 offer	Yes	Max(10-Min expected netload down ramp (50/50 forecast) + 95-th percentile ramp uncertainty following SCED target, 0). In this case, a netload up ramp is considered negative	Ramp Capability (SPP); 5-Min Flexible Ramp Down Product (CAISO). MISO also has product defined, but does not currently clear it.	Downward sloping with the shape similar to the 10-Min RUR Up flipped along the X-axis at expected ramp, but priced at 10% of the 10-Min RUR Up curve
30-Min Ramp/Uncertainty Reserves (Up-only)	30-Min RUR	RTM + DAM	Address 30-Min forward net-load ramp following energy dispatch along with associated uncertainty, residual to 10-Min RUR	30-Minutes	4-Hour	Yes + SCED dispatchable	Economically dispatched through RT-SCED at applicable time	\$0 offer in RTM; Soft Cap of \$10 in DAM. If qualifying for both 10-Min and 30-Min Spin, the offer price has to be the same	Yes	30-Min expected netload ramp (50/50 forecast) less 10-Min expected ramp + 95-th percentile of ramp uncertainty between 10-Min and 30-Min following SCED target	No ISO in the US has an equivalent product/service	Downward sloping: priced at ~\$1,900/MWh at expected ramp - 95th percentile uncertainty, \$1,000/MWh at expected ramp, and ~\$100/MWh at expected ramp + 95th percentile uncertainty, where expected ramp is between minutes 10 and 30 following SCED target
30-Min Reserves	30-Min RUR; 30-Min SecR (offline secondary reserves). Same RUR product can satisfy both 30-Min RUR and 30-Min Reserve requirement	RTM + DAM	Backfill to free up synchronized reserves following a spin event in addition to the 30-Min RUR reserves	30-Minutes	4-Hour	No	Non-Spin resources are called online by operator as needed; Economically dispatched through RT-SCED at applicable time	Soft Cap of \$10 on 30-Min Non-Spin	Yes	MSSC + 30-Min expected netload ramp (50/50 forecast) less 10-Min expected ramp + 95-th percentile of ramp uncertainty between 10-Min and 30-Min following SCED target	30-Min Reserves (NYISO); TMOR (ISO-NE); STR (MISO); 60-Min Uncertainty Reserves (SPP); Non-Spinning Reserve Service (ERCOT)	The 30-Min Reserve curve is a version of the 30-Min RUR demand curve, right shifted by MSSC, and priced at 10% of the RUR curve
Energy Gap Reserves	10-Min RUR (Up); 30-Min RUR; 60-Min Spin. 10/30-Min RUR can satisfy this requirement in addition to the previous requirements	DAM only	Procure sufficient physical generation to meet DA load forecast on elevated risk cold-weather days	60-Minutes	4-Hour (potentially reduced to 1-Hour for 10-Min Spin)	Synchronized, but need not be SCED dispatchable	Economically dispatched as energy or RT reserves through RT-SCED at applicable time	60-Min Spin has same offer price as 30-Min Spin	No	90-th percentile of historical energy gap in winter. Applied only on elevated risk days in winter	Energy Imbalance Reserves (ISO-NE); however, no explicit online requirement	Downward sloping from \$500/MWh till the 90th percentile of historical energy gap in winter, and priced at \$0 beyond the requirement. The slope is based on distribution of energy gap in historical observations
Day-ahead scheduling reserves (DASR)	10-Min RUR (Up); 30-Min RUR; 30-Min SecR; 60-Min Spin; 60-Min Non-spin. 10/30-Min/60-Min Spin can satisfy this requirement in addition to the previous applicable requirements	DAM only	Address uncertainty (errors) in DA-forecasts for load and renewables as well as generator performance	60-Minutes	4-Hour (potentially reduced to 1-Hour for 10-Min Spin)	No	Non-Spin resources are called online by operator as needed; Economically dispatched as energy or RT reserves through RT-SCED at applicable time	60-Min Non-Spin has same offer price as 30-Min Non-Spin	No	Different percentiles of forecast errors (as percentages of load / renewable forecast) based on low/medium/high risk day + energy gap requirement if applicable	Imbalance Reserves (CAISO)	Single step priced at \$50/MWh till DASR requirement and \$0 beyond it.