

Table 1: Frequency Control Product Specifications

Product	Synchronized to Grid	Deployment Method	Full AS Obligation	Deploy Deadline	Full AS Obligation Delivery Deadline	Sustain Provision
Fast Frequency Response Not in Scope – this is in SH Catalogue Propose that any design should be compatible with adding product at future date	Yes – Synchronized means connected, online (i.e. breaker closed)	Frequency event triggers automatic, autonomous governor or under-frequency relay device response	Same questions as Frequency Response	NERC recommended 18mHz	60 cycles	Respond until frequency recovers above required deadband or until re-dispatched by the ISO
Frequency Response	Yes – Synchronized means connected, online (i.e. breaker closed)	Frequency deviation event triggers automatic, autonomous response from frequency response control systems	The awarded amount would set the full AS obligation for frequency response at a rate: X MW/0.1Hz	NERC recommended 18mHz	Deliver by beginning of NERC post-event measurement period	Respond until frequency recovers above required deadband or until re-dispatched by the ISO

			X 0.1Hz drop that they will provide up to			
Fast Regulation (Up or Down) No plan to develop product	Yes – Synchronized means connected, online (i.e. breaker closed)	Automatic Generation Control (AGC) signal where resource will provide its entire AS obligation to return frequency to nominal value and minimize unscheduled transient power flows Must have primary frequency response controls	MW Amount	4 seconds to meet the most recently sent signal	60 cycles after receiving signal	10 minutes

Table 2: Considerations on Current AS products

Product	Synchronized to Grid	Deployment Method	Full AS Obligation	Deploy Deadline	Full AS Obligation Delivery Deadline	Sustain Provision	New Specifications ?
Regulation (Up and Down)	Yes	Automatic Generation Control (AGC) signal sends 4 second signals where resource	MW Amount	4 seconds to meet the most recently sent signal	10 minutes	ISO proposes that regulation should not offset the frequency response provided by procured amounts in FR and amounts contributing to regulating frequency in 20-52 should be	

		will provide its entire AS obligation by the full delivery deadline based on its ramp rate.				used to reduce FR requirement. What needs to be evaluated to achieve these goals? Other goals?
Spinning Reserves	Yes	Contingency Dispatch Operating Target (DOT) Replaces Real-time Market DOT	MW Amount	Immediately	2 hours	How should the ISO incorporate the amount of frequency response these reserves would provide merely from being unloaded capacity?
Non-Spinning Reserves	No	Contingency Dispatch Operating Target (DOT) Replaces Real-time Market DOT	MW Amount	Immediately	2 hours	None