14 Ancillary Services

Ancillary Services are typically products provided by a Resource Capability, and historically are contracted to stand by for a request to deliver changes in power to balance the grid on very short notice. Ancillary services include Regulation Up, Regulation Down, Spinning Reserve, Non-Spinning Reserve and Volt/Var support (Reactive Power). These Ancillary services are different from other power products in that they are paid for availability, whether or not they are dispatched. Of course, if dispatched, they must perform.

In general, Ancillary services support grid stability by stabilizing specific aspects of grid power attributes. There are several types of ancillary services, each defined by local market rules or utility tariffs. Ancillary services tend to be used frequently but for short durations. Common characteristics are that the Resource must have a secure, often dedicated, link to the dispatcher, must be able to respond very quickly (sub second to ten minutes), respond with accuracy, and provide rapid and accurate performance reporting. Because of the specialized and critical nature of Ancillary Services, this type of Resource Capability is tightly integrated with grid operations. Dispatch must be completely automated and utterly reliable. Failure in this area will result in a range of issues from equipment malfunction to widespread outage. For these reasons, Ancillary Services historically have been performed by specialized generators or capacitor banks. More recently, wholesale markets have piloted the origination of Ancillary Services from Demand Side Resources.

Each market or local utility will define Ancillary Services it will buy from third parties as well as the compensation mechanism for those service and the tests Resource Providers must pass to become certified, “ready to perform”. General types of Ancillary Services are Frequency Regulation, Load Following, Reactive Power (Volt/VAR), Contingency Reserves (Spin and Non-Spin), and Black Start.

Frequency Regulation/Load Following services are fast acting continuously performing resources that respond nearly instantly to compensate for fluctuations in grid power. In contrast, Contingency Reserves (Spin or Non Spin) are off-line until needed, but must be able to react quickly to a dispatch signal (usually ten minutes or less depending on type) sent when another resource suddenly stops performing.

Black Start Resources are generator based sub-grids that can start independently and produce reference grade power without relying on integration with the wider grid. These are used to restore service after outages because they can provide a reference signal required by non-black start resources.

Reactive Power offsets certain types of loads (coils or capacitors) that are capable of sending power back to the grid from what normally would be a load. Uncompensated, this potentially can be damaging to neighboring loads on the grid.

In EMIX, Reserves are described using the market semantics of Options using the EMIX Option type, which is one of the Envelopes. Performance expectations are expressed using constraints, which can appear on either side of a Tender. Strike prices and the penalty for non-performance are part of the option agreement.

Because it is useful to have a short-hand to refer to these services, they are enumerated in the Power Option Type enumeration which is incorporated into the Power Product Types. The enumerated Power Option Types are: Spinning Reserve, Non Spinning Reserve, Operating Reserve, Black Start Recovery, and Reactive Power. Because the exact definitions vary from market to market, and will continue to vary over time, EMIX does not define these terms. All definitions and performance requirements SHALL be expressed through the constraints.