|  |  |
| --- | --- |
| **MD-07 Wind-powered Generation Resources Providing Ancillary Services:** As more WGRs are added to the ERCOT system it may become useful for WGRs to provide certain ancillary services. If WGRs can provide needed services it may relieve ERCOT of the need to schedule conventional generators on line just to provide the needed services. The situation that seems likely to occur is high wind-power production during low load times in the spring. If there is sufficient wind powered production to lower conventional resources output near their Low Sustained Limit (LSL) then the ability of the conventional resources to provide down regulation may be limited. An Ancillary Services study performed by General Electric identified issues that need further study. At this time the additional studies have not been started.  The high wind-power output and low load operation may call for wind-generation to be curtailed, then market prices will be very low, even negative (generators pay to produce power). Deployment of ancillary services is less costly to generators operating neat the market price. If market prices go negative (WGRs on the margin) then conventional generators are operating far from the market price and WGRs are operating near the market price. The latest technology WGRs have the technical capability to provide regulation services when there is enough wind. This issue was raised to begin exploring the most efficient way to operate when WGR capacity is above 15,000 MW and load levels are low and WGR output is high. When wind velocity is high modern WGRs are at their best in quickly and accurately controlling their output. There is every expectation that WGRs will be able to respond very effectively to ancillary service deployment orders in these conditions.  The following issues need to be explored:   1. How will conventional generators deal with the risk of prices going negative when offering to supply ancillary services?   Negative prices require the generator to pay for each MWH produced. There are three components to the production from a generator. First there is the minimum loading (LSL) required for the generator even to be available to provide ancillary services. In a negative price environment conventional generator minimum running cost can be quite high. Next there is any need to reserve capability to provide the service. For Reg Down, the generator must be above its LSL by the amount it has promised to sell to ERCOT unless ERCOT deploys the service. Producing the extra energy above LSL will be very costly for a conventional generator when market prices are negative. Lastly, there will be energy produced by the generator when reg up is deployed; again costing the conventional generator a lot to produce its power when the market is negative.   1. What mechanisms exist or need to be added to the current nodal market design to allow WGRs and conventional generators to coordinate their provision of ancillary services?   Coordinated operations could reduce the market risk for conventional generators and increase production for WGRs.   1. To what extent would provision of ancillary services by WGRs reduce the need for ERCOT to commit conventional generators? 2. What if any changes are needed to the nodal protocols to allow WGRs to provide ancillary services and to maximize the value of WGRs to the ERCOT system? 3. What if any changes are needed in WGR operating procedures or capabilities to provide ancillary services to ERCOT? | |
| **Priority** | Medium |
| **Considerations** | Policy: None |
| Reliability: Proper procedures need to be put in place to insure that reliability is maintained. |
| Technical: None, modern WGRs can provide excellent services if wind conditions are right. |
| Market: There could be significant improvement in efficiency if WGRs are integrated into the overall provision of ancillary services. |
| Performance/Compliance: There may be new performance measures needed to insure that WGRs are providing the needed service. |
| Cost Allocation: None |
| **Strategy** | Anticipate issues to provide sufficient time to analyze, resolve, and implement as needed.  Recommendation: Start a process of reviewing and discussing the mechanisms for WGRs to provide ancillary services. |
| **Activities** | ERCOT (E X): Develop tools to evaluate the mechanisms to deal with low load and high wind scenarios. Perform studies of alternatives to evaluate the most effective and economical way to reliably operate during low load situations (see SO-05) |
| Market Participants (MP X):  WGRs assist in evaluating system operations alternatives. Make any needed modifications deemed commercially expedient to participate in providing ancillary services. |
| **Follow-Up** | May need protocol revisions depending on the results of the analysis |
| **Schedule** | This is primarily a market issue that will likely be important when more than 15,000 MW of WGR capacity is on the system. Discussion of the issue needs to be started soon and implementation will most likely be beneficial by 2013. |